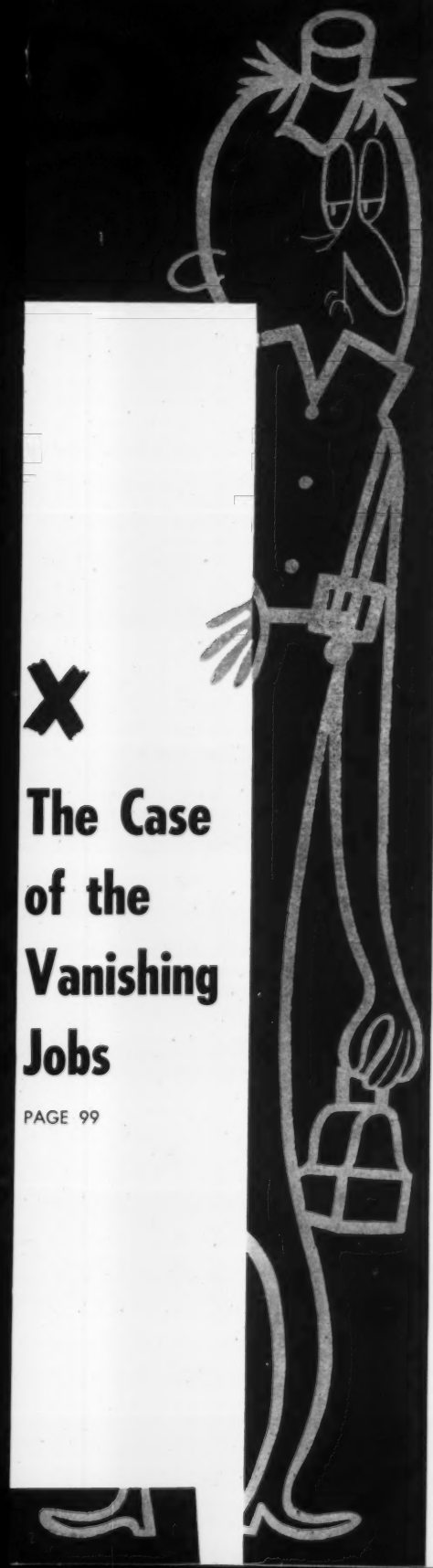
APRIL 6, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



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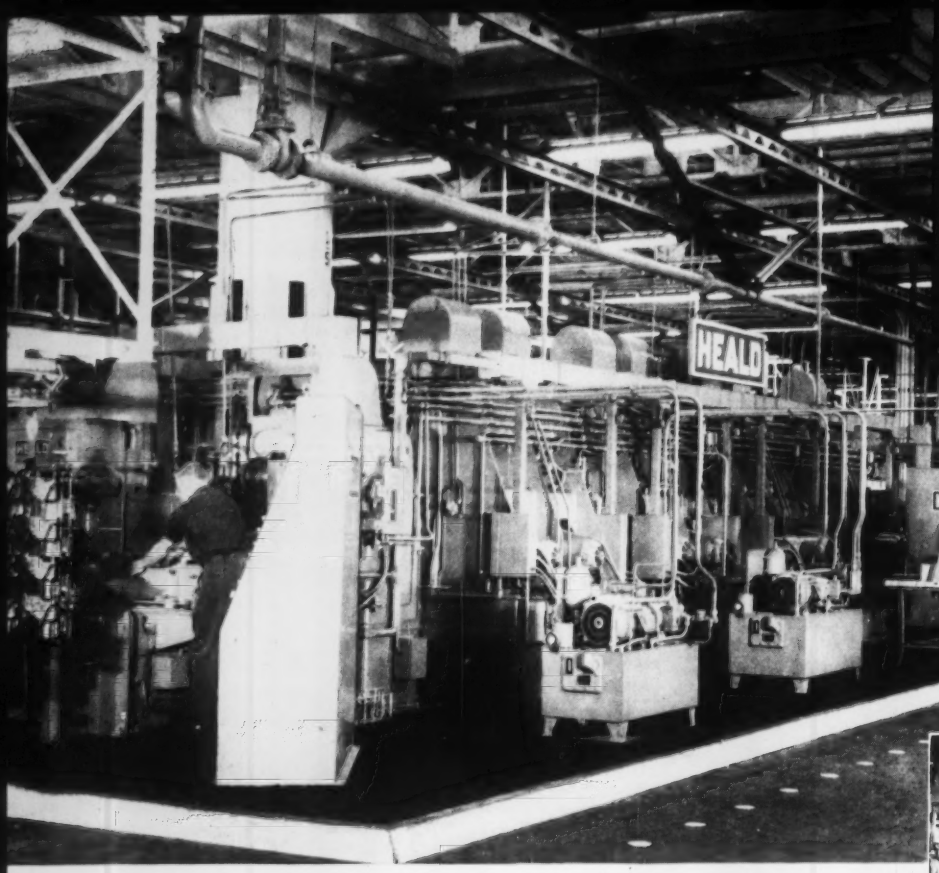
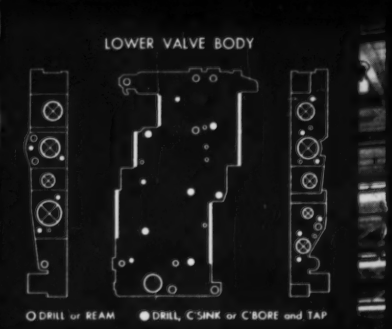
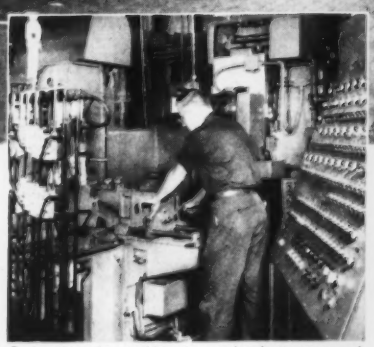
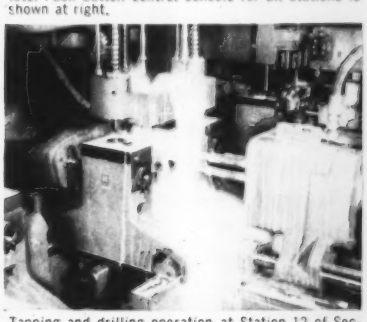


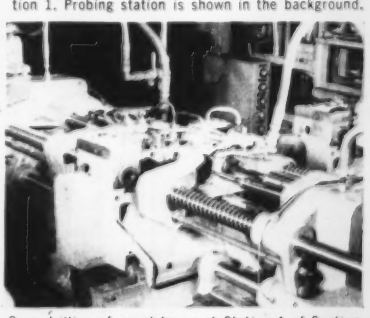




Parts come to machine on overhead conveyor and are semi-automatically loaded onto the transfer pallets. Push button control console for all stations is shown at right.



Tapping and drilling operation at Station 12 of Section 1. Probing station is shown in the background.



Core drilling of spool bores at Station 4 of Section 2. Bores are then semi-finish and finish reamed and air gaged for diameter.

HEALD AUTOMATED LINE performs

171 OPERATIONS

Two identical 39-station Bore-Matic transfer lines drill, bore, ream, tap, face, probe and gage 48 bores and 5 side faces of transmission valve bodies

REPRESENTING the ultimate in straight-line automation, these Heald Model S Bore-Matic transfer lines are speeding the precision production of valve bodies at one of America's leading automotive plants.

Each line consists of two 50-foot sections — a 19-station section for the small-bore and semi-finish facing operations and a 20-station section for core drilling, reaming and finish facing. A total of 171 operations (112 machining, 52 probing and 7 air gaging) are performed in a fully automatic palletized transfer line with a cycle time of 18 seconds for each station.

Compared to previous methods, the new Heald system results in less handling and locating of parts, fewer rejects, greater efficiency and substantially lower production costs.

For complete information on this interesting installation, send for a copy of the February 1959 issue of The Heald Herald.

IT PAYS TO COME TO HEALD!

HEALD®

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

What's the limit on cold-headed wire parts?

Some of these items cold-headed from wire exceed the supposed limits of just a few years ago; who can say how far the frontiers of cold-heading will be advanced in the next few years?

The key to cold-heading's phenomenal success is the wire metallurgy. Steel wire for cold-heading is a Bethlehem specialty, and our metallurgists have had years of experience. Bethlehem cold-heading-quality wire is made to rigid standards. It is uniform in analysis and free from injurious surface defects. Thorough inspection, at every stage of production, is behind every ton we ship.

At your invitation we will gladly study your products, equipment and process, and recommend the grade of steel that will perform the best. Then we'll carefully produce the steel to meet your needs.

Bethlehem makes nearly every kind of steel wire. Why not discuss your cold-heading or other production problems with one of our technical men? There are many ways in which our engineers might be able to help improve your production of cold-headed items. Just phone the nearest Bethlehem district sales office, or write direct to the address below.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

FRANK J. DECRANE, *Director of Purchases, Lamson & Sessions, tells why he believes...*

"Creative buying" plays a vital part in creating customers

AT L & S, we consider *creative buying* as vital as *creative selling*—in serving our customers most efficiently.

The "creative" part comes in working closely and continuously with our established sources, to improve our products and reduce costs. We frequently suggest improved or alternate materials—to do a better job at an established cost, or the same job at lower cost. EXAMPLE: on a type of raw material we buy in large quantities, investigations were recently carried out with several leading suppliers. Result—we're obtaining *a better product at a 27% saving*, now being reflected in reduced costs for our customers.

Creative buying offers other customer benefits, too. It means maintaining ample supplies of raw materials, so we can produce and deliver what you need without delay. It means throwing out "rubber-stamp" thinking—substituting imagination and ingenuity—to obtain production parts in emergencies.

Take advantage of this creative, customer-minded approach to purchasing at L & S, another reason why . . .

L & S Fastener Engineering helps you "tighten up" on...

- PURCHASING COSTS
- INSPECTION AND HANDLING COSTS
- ASSEMBLY COSTS

LAMSON & SESSIONS

5000 TIEDEMAN ROAD • CLEVELAND, OHIO

Plants in Cleveland and Kent, Ohio • Chicago and Birmingham

TOCCO Induction Heating unit and SWIFT-OHIO press mechanism work together for better, flash-free buttwelding of pipe and tubing.

Speedy Buttwelding
That Leaves No Flash

with TOCCO* Induction Heating

and Press Mechanism by SWIFT-OHIO

Now, in less than a minute you can get flash-free, smooth joints on any size pipe, regardless of its diameter or wall thickness.

Conventional buttwelding methods produce strong, sound joints but leave a brittle flash inside or outside the pipe. Inside flash can seriously impede fluid flow. Particularly on long lengths of pipe, removal of this inside flash is a real production headache—time consuming and expensive.

Whether *your* production bottleneck involves buttwelding, soldering, brazing, heat treating or forging, it pays you to investigate TOCCO as an economical way to do it better, faster and at lower cost.

JUST PUSH A BUTTON

TOCCO

*Trade-mark Reg. U.S. Pat. Off.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today—NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. S-4, Cleveland 5, Ohio

Please send reprint of article from STEEL Magazine entitled "Buttwelder Leaves No Flash".

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

new tracer from LeBlond!

REGAL TRACE

new principle, new design, new convenience, new price... as low as $2760!

Now, simply by adding Regal-Trace, you get all the advantages of tracer lathe production with your present LeBlond Regal and Dual Drive Lathes. Easy, fast, accurate—Regal-Trace gives your lathe low cost duplication of parts for high production turning. Prices begin as low as $2760 for the 13″ Regal model.

Easy to use—Operates from easily prepared flat templates. Traces radii, stepped shafts, contoured faces, tapers, compound and spherical curves. Simple to set up. Can be installed in less than 15 minutes. Self-contained—only 4 major parts, all mounted on lathe. Hydraulic unit becomes an integral part of the machine (does not interfere with normal lathe operation). Tracer unit quickly replaces compound rest.

Fast and accurate—Locked-circuit hydraulic system produces exceptional responsiveness and precision. Regal-Trace will consistently duplicate part after part to accuracy of ± .0005″. Feed rate of 75″ per minute keeps up with speediest cuts. Fits any LeBlond Regal built since 1955, and all Dual Drives. Regal-Trace is the ideal lathe attachment for tool room or production turning. See your LeBlond Distributor or write today for complete information. Ask for Regal-Trace Bulletin.

. . . cut with confidence

The R. K. LeBlond Machine Tool Company

Cincinnati 8, Ohio

world's largest builder of a complete line of lathes for more than 72 years

LeBLOND of Cincinnati

This Week in STEEL
The Metalworking Weekly

April 6, 1959
Vol. 144 No. 14

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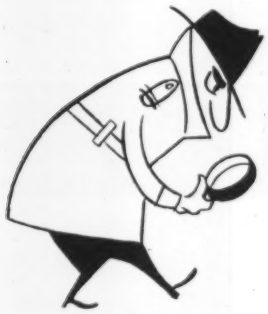

The Case of the Vanishing Jobs!

For several years, particularly since 1954, jobs had been vanishing. Where had they gone? Why? How many? Acton Chance, STEEL's own private eye, was asked to take on the case—the biggest he ever worked on. He's come up with some answers that'll interest you.

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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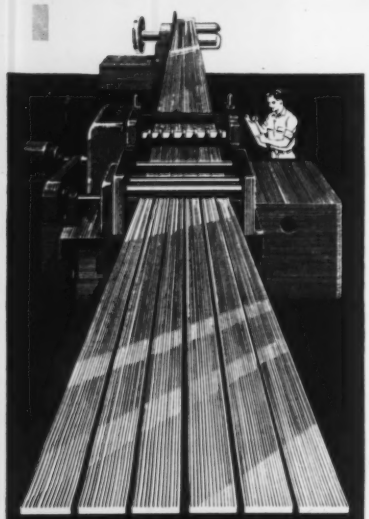
YODER

Rotary Slitters

Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition.

Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Slitter Book.

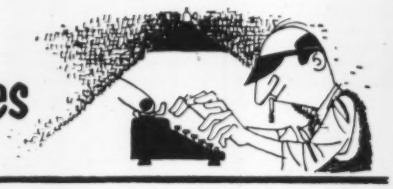
THE YODER COMPANY
5502 Walworth Ave., Cleveland 2, Ohio



ENGINEERING YODER MANUFACTURING

ROTARY SLITTING LINES
PIPE AND TUBE MILLS
ferrous or non-ferrous
COLD ROLL FORMING MACHINES

behind the scenes



The Doctor Reports

STEEL editors had long toyed with the idea that consumer buyers and industrial buyers were brothers under the skin, and that cliche is no more tired than the thought that industrial advertising is obliged to employ different fundamentals than consumer advertising. With a view toward an endorsement of their thinking, our editors approached Dr. Robert E. Shoaf, motivational research consultant and assistant professor of marketing, New York University, and commissioned him to investigate the mechanics of industrial purchasing.

Dr. Shoaf is no ordinary interviewer; he uses the secret arts of psychology and subliminal stimuli to probe the psyche. (By cracky, that line sounds so impressive we are going to stand for a moment in silent contemplation.) In this instance, he termed his operation a motivation research type study; he interviewed 137 metalworking managers, particularly those functionally engaged in administration, production, engineering, and purchasing, in 14 cities. His report appears this week, beginning on Page 104, and we hope you give it the attention it deserves.

Dr. Shoaf's findings are particularly germane to selling and marketing operations in metalworking. You are welcome to make use of his report—it comes under the heading of STEEL service, you know.

Imports Vs. Jobs

The story advertised on this week's cover may be brief, compared with such opi (dig that crazy plural!) as *Anthony Adverse* and *Gone With The Wind*, but it carries a message for all of us. A writer who employs the style of a private eye tells us that imports are interesting, but as imports rise, American jobs decline. The problems of tariffs, duties, exports, imports, and free trade began when men came down from the trees and began to make things with their hands, and those problems are still with us.

The author chooses to be anonymous, but we rather suspect Associate Managing Editor John Morgan. He has been observed boning up on literature concerning the St. Lawrence Seaway, the Merchant Marine, international trade, trade union reports, and other subjects closely allied to imports. If he says the rising tide of imports is drowning out many jobs, you can depend on it; he knows what he is talking about. Before he taps a key, he does a thorough job of research. How about your job? Is it safe? If we keep on importing foreign widgets, which are just as good as ours, and twice as cheap, how long do you think you can continue producing widgets? The story begins on Page 99.

What Price Germaniums?

G. & C. Merriam Co., Springfield, Mass., dictionary publishers, periodically circulate a pamphlet called *Word Study* to teachers of English. Naturally, the circulation list is select, and you may be sure that since we didn't rate it by merit, the sample copy we obtained was the fruit of theft. In its columns, word sharks kick around stories of words, expressions, and what have you. An item in the October, 1958, issue comments on the difficulties confronting the writer who lightly attempts to pluralize flower names. You can say a bunch of roses, or daisies, but how are you going to say a bunch of hibiscus? Hibiscussies? Hibisci? The simplest thing is to switch to buttercups, but that is the coward's way.

We raise the question because readers speak of certain irons, and steels, and what's going to happen if somebody wants to mention other metals in plural form? What, for example, would you do with germanium, columbium, bismuth, beryllium, or radium? Perhaps we ought to turn the case over to G. & C. Merriam, and turn to sweet potatoes.

Postal News

Rand Ebersole, STEEL's efficient distribution manager, keeps right on top of the postal situation by closely reading the *Postal Bulletin*, a weekly produced by the Post Office Department, containing instructions and informations for postal employees. Among other nuggets of interest, we learn from the Mar. 19 *Bulletin* that Robert John Widger, for whom a wanted circular was issued by the postal inspector in charge, Denver, is no longer wanted by the postal inspectors.

We'd like to know more about Robert John, but Rand intrudes. "It says here," he began, "that all seed sweet potatoes and sweet potato plants from any place in Alabama or Georgia should be sent to Monroe, La., for terminal inspection because of the sweet potato mosaic. Now, you're a sort of a hillbilly; do you like sweet potato mosaic?"

"Mr. Ebersole, you are pulling our leg. In plant pathology, any of certain virus diseases characterized by mottling of the foliage is known as mosaic disease."

You should have seen how Ebersole slunk away. Of course, he had no way of knowing that we had spent the morning with a dictionary!

Shirdlu

(Metalworking Outlook—Page 91)

Want a Press to Triple Your Forging Output?

We'll build the press for all your forging requirements . . .

Tell us your forging problems and give us your production specifications—we'll do the rest.

Erie Foundry, one of the first companies to automate forging, can provide specially designed *high volume* presses in capacities of 1000 to 8000 tons. Instead of the three machines and nine men formerly required, now you need only one Erie automated forging press and only one operator observer—to triple your present production rate! Trimming, too, can be accomplished in a single production cycle. With billet supply and finished part removal conveyorized, it is possible to achieve a production volume of, say, 1200 track-link forgings per hour.

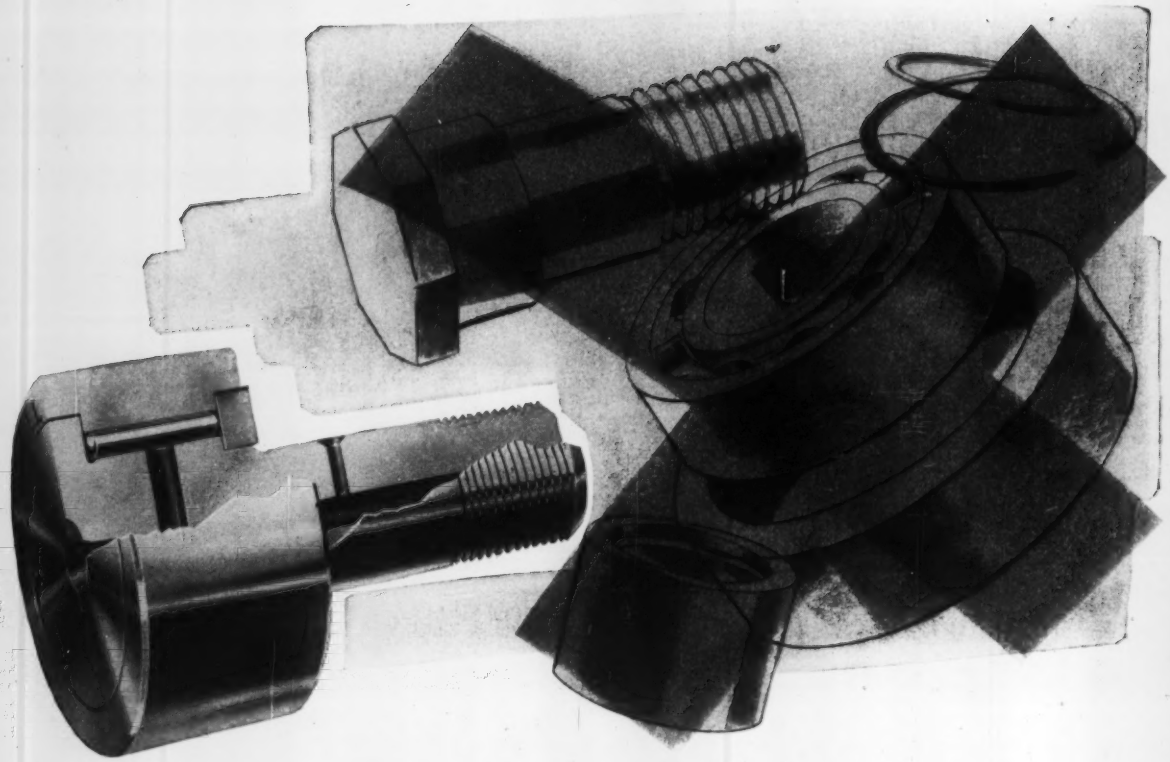
Erie Foundry has a complete line of machines designed for high volume production of such parts as connecting rods, gear blanks, automotive and tractor valves, pinions, track links and wheel hubs.

We would like to discuss application of automated presses to your production requirements. For the complete story, phone or write Mr. R. E. Sanford, Erie Foundry Company, Erie 2, Pa.

ERIE

ERIE FOUNDRY CO.

The world's great name in forging since 1895 EF-59-01



McGILL® CF *CAMROL*® bearings

eliminate the cost of producing and assembling improvised cam follower, track and guide roller units

THESE CAMROL ADVANTAGES SOLVE COST, DESIGN, PRODUCTION AND PERFORMANCE PROBLEMS:

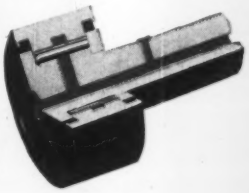
• AVAILABILITY • INTEGRAL UNIT CONSTRUCTION • HIGH LOAD CAPACITY • SMALL RADIAL SPACE REQUIREMENTS • HIGH SHOCK RESISTANCE • PRECISION ACCURACY • SIMPLIFIED LUBRICATION

You can simplify design and cut cost with CAMROL, precision cam followers. Procurement, production and assembly of components for improvised units are eliminated when you specify CAMROL bearings that are available from stock.

McGill developed the original roller bearing cam follower and perfected the CAMROL design through 25 years of application experience. Its full type construction provides exceptionally high capacity in an integral unit of a flanged, specially heat treated stud and heavy shock resistant outer race. Grease lubrication is simplified. Plain bearings require constant oil lubrication and bolt mounted ball bearings races crack under equivalent loads.

Precision construction, including concentricity of stud to outer race OD, provides accurate alignment of machine members. Ease of interchangeability and dependable operation in any cam action, track, guide or support roller application is assured. Use the CYR series in the same roller diameters for shaft mounting.

PRE-LUBRICATED SEALED CAMROL BEARINGS



These bearings combine the advantages of CF and CYR series bearings plus effective sealing against dirt, dust and grit. Ideal in applications where lubrication is a problem. Black ferrous oxide finish resists corrosion in contaminated areas.

CAMROL bearings are available in standard roller diameters from ½" to 4". Capacities to 20480 lbs. at 100 RPM.

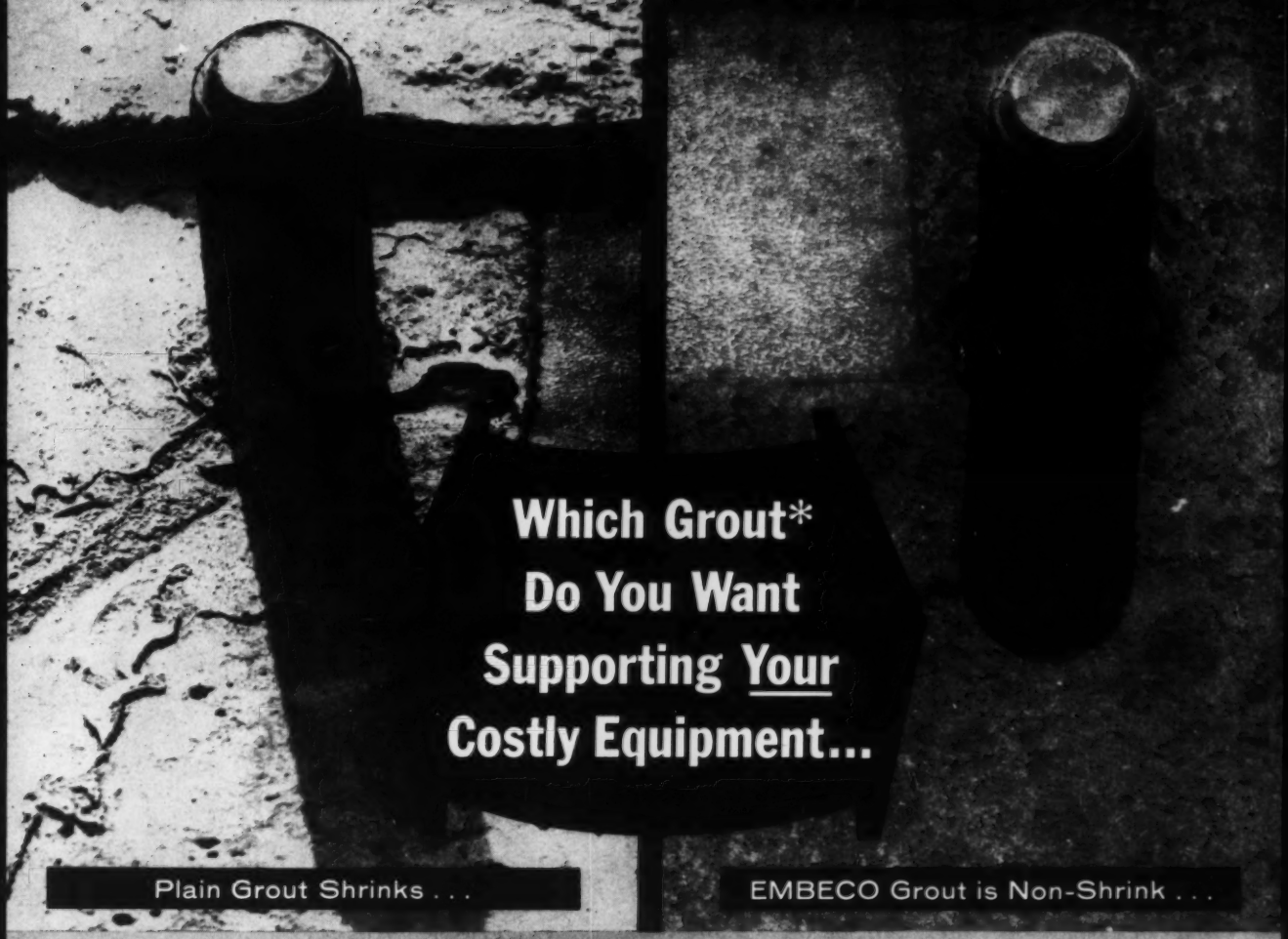
WRITE FOR FREE CATALOG NO. 52-A

engineered electrical products

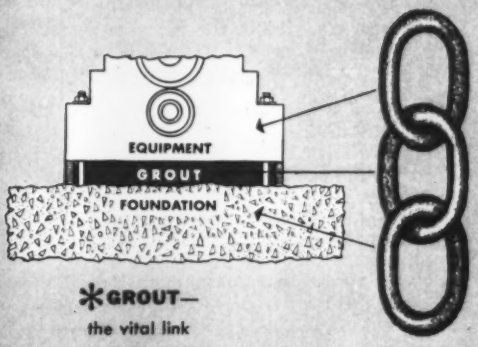
McGILL®

precision needle roller bearings

McGILL MANUFACTURING COMPANY, INC., BEARING DIV., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA



. . . to withstand: IMPACT • POUNDING ACTION • VIBRATION • SIDE THRUST • TORQUE



***GROUT**—
the vital link
between equipment
and foundation

LEFT PHOTO. . . *Plain Grout* shrinks and leaves only a web of mortar and a small shim area to support bedplate . . . results in a *short-life* grout which causes costly shutdowns, possible equipment damage, and loss of production.

RIGHT PHOTO—*Embeco Non-Shrink Grout* . . . provides full bedplate support, maintains alignment and has high impact resistance . . . is a long-life grout that avoids trouble and cost of untimely re-grouting.

Full information on Embeco Pre-Mixed Grout and "Grouting Specifications"—a valuable guide on machinery and equipment grouting—on request.

The Master Builders Company, Division of American-Marietta Company. General offices: Cleveland 3, Ohio and Toronto 9, Ontario. International Sales Department: The Lincoln Bldg., New York 17, N. Y. • Branch offices in all principal cities—Cable: Mastmethod, New York.

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EMBECO*

*EMBECO is a registered trademark of The Master Builders Company for its flowable, non-shrink grout

Now you can do both . . .

SHORT RUNS
LONG RUNS

. . . Drilling and/or Tapping . . .

with ONE adjustable U. S. Drill Head

Complete versatility for job shop operations with standard adjustable arms . . . or, equip these heads with U. S. Slip Spindle Plates which are jig-bored for positive alignment to fit the hole pattern. Eliminates trial-and-error in set up.

Double Duty Tools — when your drilling machine has a reversing spindle, you can drill and tap the same hole pattern with one head.

U. S. Drill Heads are fast and rugged — designed and built for profit-making performance Positive all-gear drive with shaved gears, anti-friction bearings, and oil-tight housings assure smooth and accurate operation.

Slip Spindle Plates may be jig-bored for more than one pattern of holes.

Ask for Catalog AD-57, or send specifications of your requirements.

US DRILL HEAD

Adjustable and Fixed Center Multiple Drilling Heads.
Individual Lead Screw Multiple Tapping Heads.

UNITED STATES DRILL HEAD CO.

BURNS STREET • CINCINNATI 4, OHIO

LETTERS
TO THE EDITORS

Impressed with STEEL's Subjects

We are pleased with the article, "Conveyor Sales Rebound" (Mar. 16, p. 61). Will you send us a dozen tearsheets to circulate to our trade salesmen?

I think this is an excellent time for us to congratulate you on the splendid magazine you consistently publish. We are quite impressed with the broad scope of subjects covered and the educational value obtained from them.

Hubert F. Green
Sales Manager
Speedways Conveyors Inc.
Buffalo

A Look at Depreciation

We feel that one of industrial America's most frustrating problems is the rigid and outdated federal system of tax depreciation.

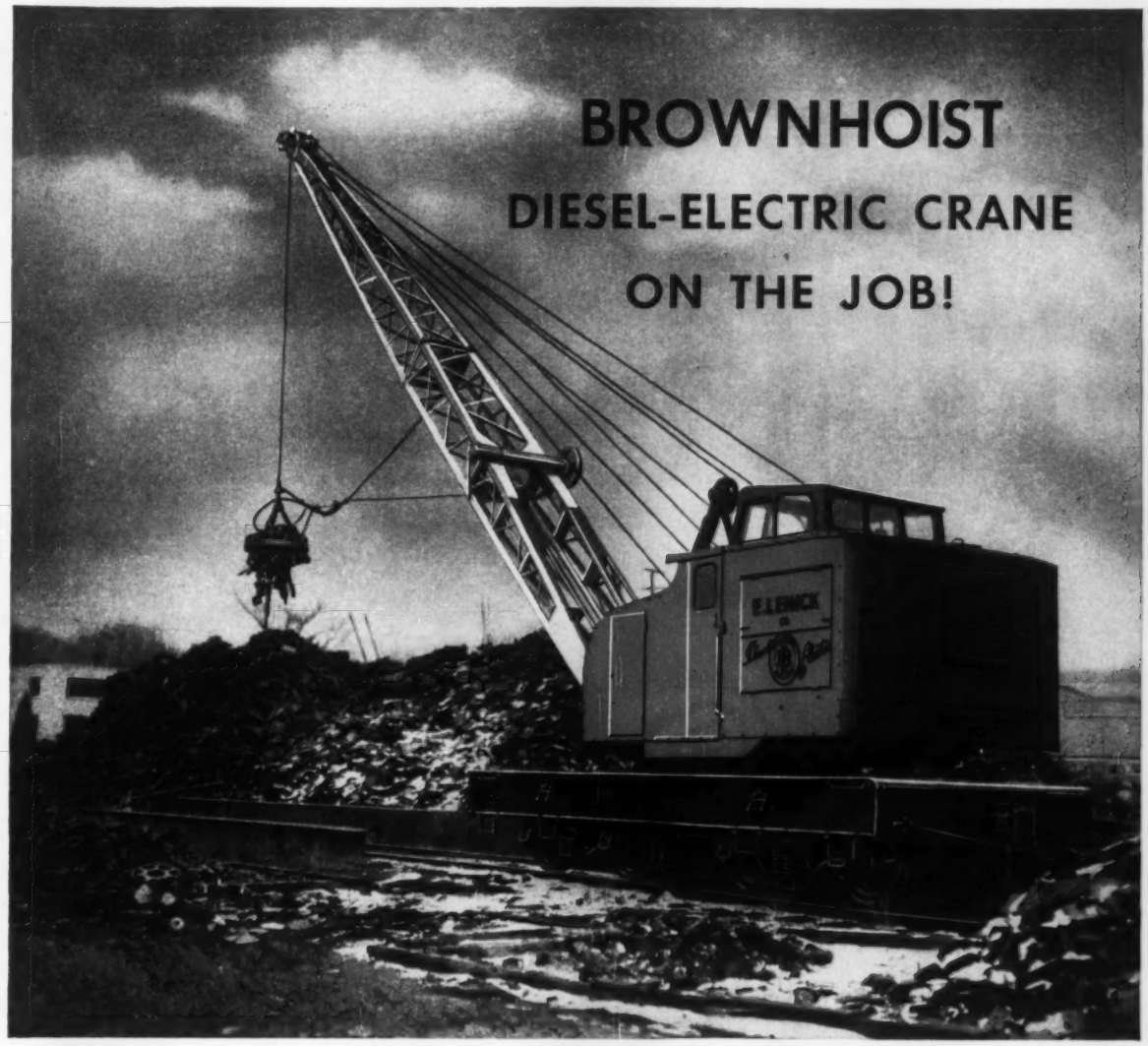
As a long range policy we believe the government should adopt a replacement cost approach to depreciation for federal income tax purposes. By allowing the taxpayer to use replacement cost as a basis for his depreciable assets, tax deductions would match true income. Various methods of suitably providing for increased costs of fixed asset replacement should be recognized, with choice of alternative methods left to each taxpayer's own election. It is believed that replacement cost depreciation should be prospective in operation to reduce the impact on tax revenues.

Meanwhile, legislative action should be taken to extend the 20 per cent initial depreciation allowance to include the cost of all property acquired during the year instead of being limited to only $10,000 of cost as at present under the 1958 Small Business Tax Revision Act.

Immediate legislative or administrative action should be taken to permit the use of the taxpayer's book allowance for depreciation on new additions. This would avoid the costly and time-consuming maintenance of separate records on depreciation for tax purposes.

A step toward a solution to updating the treatment of depreciation under federal tax policies would be a revision to provide for realistic lives of productive equipment together with recognition of

(Please turn to Page 12)



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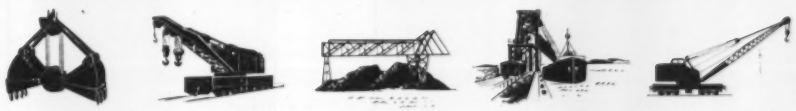
One of the big scrap dealers in the midwest, E. Lenick & Company relies on an Industrial Brownhoist 25 Ton Diesel Electric Locomotive Crane for high-capacity production and trouble-free, economical operation. The Diesel Electric Locomotive Crane is built in capacities from 25 to 90 tons. Utilizing a clam-shell bucket, hook or magnet, this versatile equipment handles materials at sea ports, steel mills, ore and coal docks and in railroad yards throughout the world. Such high performance features as exclusive 360-degree monitor-type cab, clear-vision boom, straight line power train and electric rotation have made Industrial Brownhoist Diesel Electric Locomotive Cranes the world's most reliable high-speed, high capacity material handling equipment.

For more information on specialized equipment in any tonnage and capacity, write for Industrial Brownhoist catalog #562.

BROWNHOIST



CLAMSHELL BUCKET 250 TON WRECKING CRANE COAL-ORE BRIDGE CAR DUMPER LOCOMOTIVE CRANE

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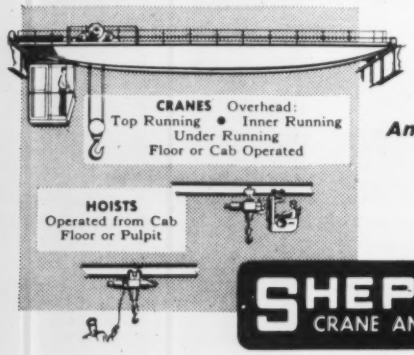
SHEPARD NILES

Large Industrial Cranes 1 to 450 TONS

FOR OVER 50 YEARS, Shepard Niles has been a distinguished name in cranes. A pioneer in the overhead crane industry, Shepard has never failed to modernize and progress through the years. Today its cranes serve thousands of satisfied users, plus an ever-increasing number of new customers.

Shepard offers a complete line of heavy industrial cranes . . . from 1 to 450 tons . . . for light, medium or heavy service. Available for constant or intermittent duty in slow, medium and high speeds; operated from cab or floor. Let a Shepard Niles representative help you select the crane that best fits your plant's load-handling requirements.



• Write for latest Bulletin . . . request a representative to call.

America's Most Complete Line of Cranes and Hoists Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION

2384 Schuyler Ave., Montour Falls, N. Y.

LETTERS

(Concluded from Page 10)

future obsolescence based upon current usefulness.

To prevent abuse of depreciation allowances, capital gain arising on the sale of depreciable assets should be treated as ordinary income except to the extent that the sales proceeds exceed the original cost of the asset sold.

E. V. Olds
Assistant Comptroller
Chrysler Corp.
Detroit

Article Evokes Interest

Your special report, "Steel Takes on Warmth of Color and Feel" (Mar. 9, p. 73), has evoked considerable interest among our personnel. We would appreciate having six copies of this for our library.

Hugh Abercrombie Jr.
Advertising and Public Relations Dept.
Mesta Machine Co.
Pittsburgh

Wants Story for House Organ

I would like permission to reprint the article, "Inexpensive Chromates Give Zinc Surfaces Color Appeal" (Jan. 12, p. 74), in a house organ which we distribute to the men in our plant. I believe this article would be of interest to them.

V. M. Provow
Purchasing Agent
Editor, *The Slab*
American Zinc Co. of Illinois
East St. Louis, Ill.

• *Permission granted.*

A Friend's Recommendation

A good friend has just given me a copy of "Building Marketing Men" (Sept. 22, 1958, p. 69) with the recommendation that I read it carefully.

I found this article most interesting and would like to get three reprints if they are still available.

D. W. Sargent Jr.
New England Sales Office
Anaconda Aluminum Co.
Needham Heights, Mass.

Not a Standard Lubricant

We note with interest the artcle, "Pipe Coating Adds to Draw Die Life" (Feb. 23, p. 82). This is not a "standard lubricant."

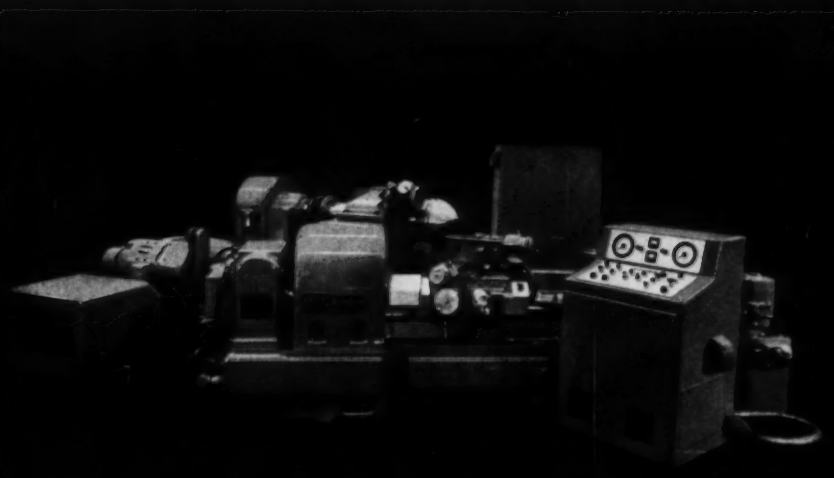
We are suppliers of the specialized lubricant used over oxalate undercoatings. In this case, it is Lube-a Tube #14-W, formulated for drawing stainless steel tubing.

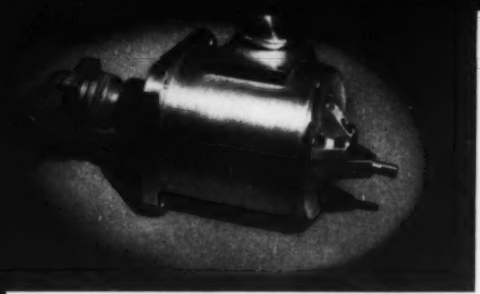
We would appreciate bringing this to the attention of your readers who might run into difficulty should they try to draw such tubing with a standard lubricant.

John H. Richards
G. Whitfield Richards
Philadelphia

Don't Tool Up for Tomorrow's Boom with Yesterday's Lathes

MONARCH'S SPECIAL-PURPOSE LATHES OF TOMORROW...





The Series 180 tracer head—an advanced engineering jewel from the Development Laboratories of Monarch.

2..The Series 180 Ultra-Precision Contouring Lathe

Ultra-precision tolerances are brought to a new degree of perfection on this chucking type machine for contouring the O.D. and I.D. of thin-wall spherical and related shape work pieces. From the floor up the Series 180 is new in concept. For example:

1 The Monarch electro-hydraulic tracer has a stylus deflection pressure of only 1½ ounces. This, plus electrical amplification of stylus movement, instantly translates template contour change into hydraulic slide movement.

2 Tracing around a template, the contour is reproduced at the tool within a total accumulated error of ±75 millionths.

3 The constant surface cutting speed drive is separately mounted to eliminate vibration transmittal to the bed.

4 Drive is flexibly coupled to the spindle which is set at a 30° angle to the bed axis. Runout at the spindle nose is less than 20 millionths.

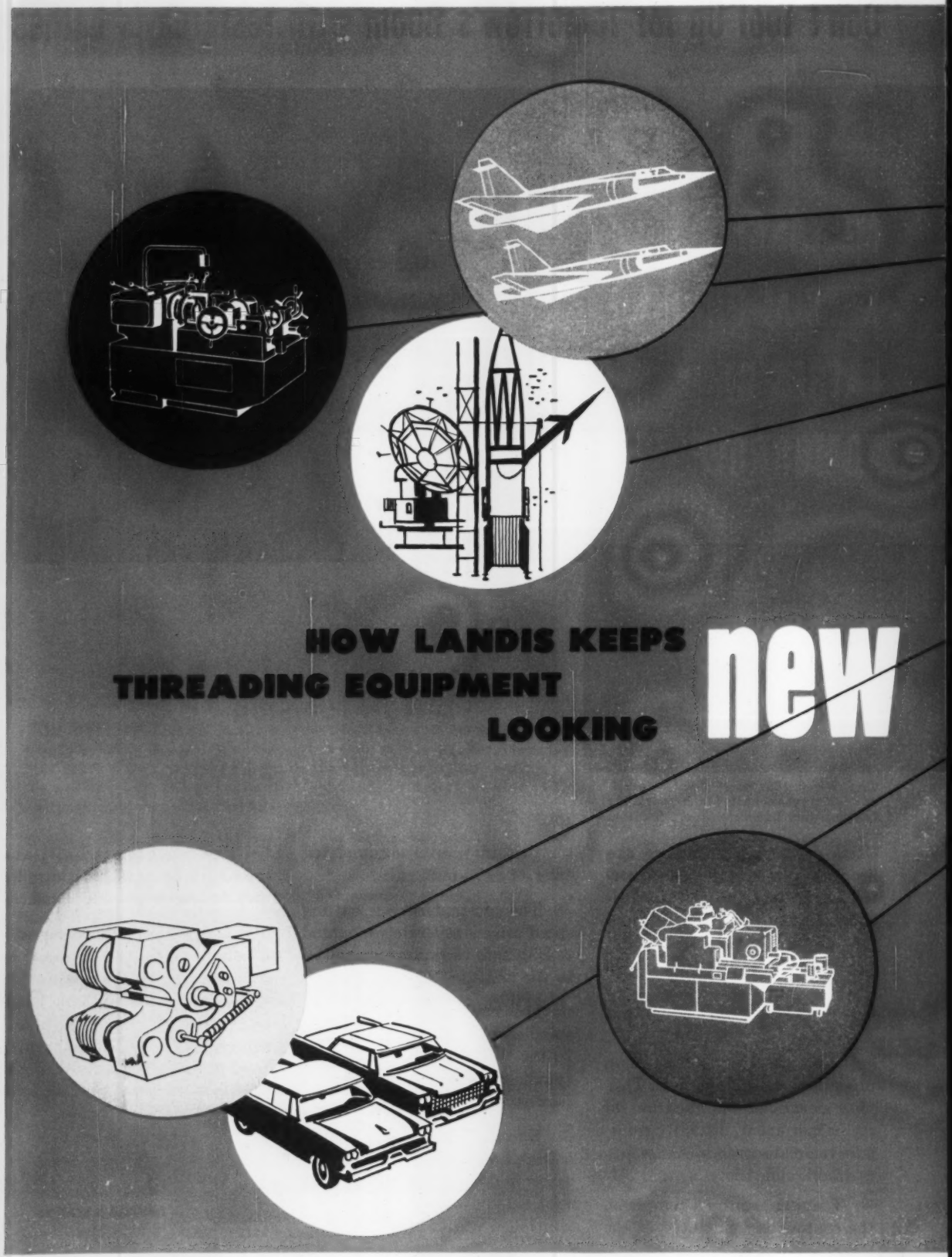
5 Spindle bearing lubricant is refrigerated; the floor-mounted tracer hydraulic tank is separately cooled and coolant temperature is controlled within ±.5°.

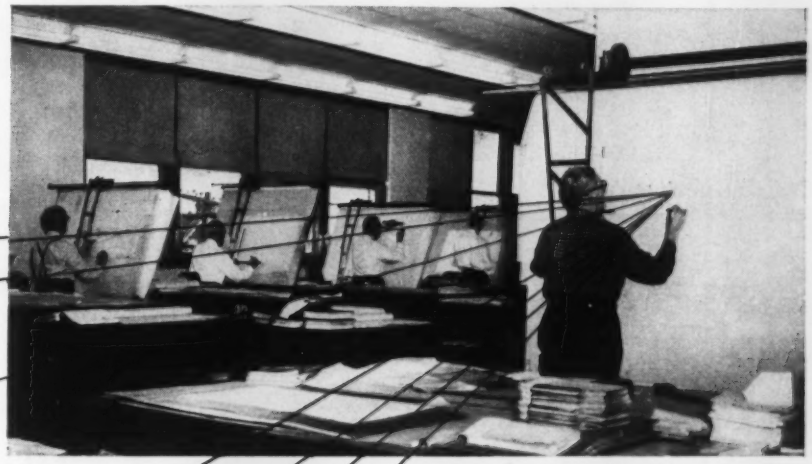
6 The machine is built and tested in a temperature controlled area and must be so operated.

The performance characteristics of the Series 180 cannot be equalled by any other lathe. Development of this machine is but another example of the many seemingly impossible turning problems solved by . . . *The Monarch Machine Tool Company*, Sidney, Ohio.

Monarch
TURNING MACHINES

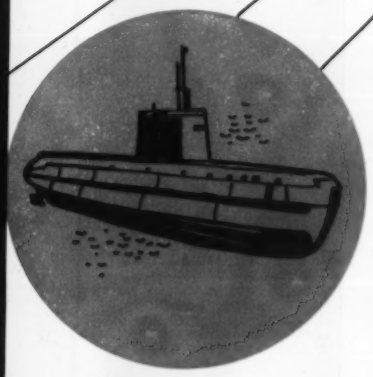
IF IT CAN BE TURNED, THERE'S A MONARCH TO DO IT BETTER AND FASTER


HOW LANDIS KEEPS
THREADING EQUIPMENT
LOOKING
new



Through the advance thinking of LANDIS research and development new threading equipment is constantly being introduced . . . improved to do the job faster, easier and at less cost.

LANDIS has within the last several years produced many new developments . . . the LANROLL Thread Rolling Attachment . . . the LANHYROL Thread Rolling Machine . . . the LANDMACO C-Type Threading Machines . . . Taper Thread Rolling with the LANROLL Attachment . . . the Automatic Coupling Tapping Machine . . . Thread Rolling Heads . . . and even now new products are on the drawing boards and the testing floors. Recently released was our new production type high speed LAN-NU-ROL Thread Rolling Machine. Each of these machines and tools was designed to improve a specific threading operation. For example, new sizes and types of Die Heads and Collapsible Taps now available are suitable for many jobs that in the past could not be threaded by this equipment.

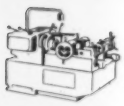


These new additions to our line emphasize our policy to continue product expansion whenever a need exists. Today, we offer the most extensive line of threading equipment available anywhere. Perhaps one of your threading jobs could be done more efficiently with a modern machine or tool developed from our half-century experience in a single field—THREADING. For detailed information, please send specifications and describe type of operation.

LANDIS *Machine* COMPANY

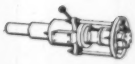
WAYNESBORO • PENNSYLVANIA • U. S. A.

THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT

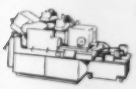


Threading Machines

Die Heads—Rotary & Stationary

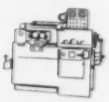


Taps—Collapsible & Solid Adjustable



Centerless Thread Grinding Machines

Thread Rolling Tools



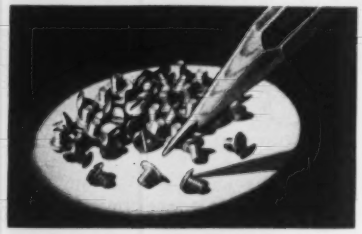
Thread Rolling Machines

538C

IT PAYS TO HAVE HUBBELL GOOD CONNECTIONS

Manufacturers of Cold Headed Fasteners Since 1888

OVER **5** TIMES
THE RATE
AT **45%** LESS COST



Another example of how Hubbell Cold Heading produces Better Parts at Faster Speeds, at Lower Cost

THE PART:
Special 1-64 Miniature Binding Screw

THE MATERIAL:
18-8 High Tensile Stainless Steel

THE METHOD:
Hubbell Cold Heading in place of screw machining

THE RESULT:

a. Production increased from original rate of 7000 pc. p.d. to cold heading rate of 40,000 pc. p.d.

b. Cost reduced 45%

c. Finer Quality—More Economical Production

1. Higher Tensile Strength
2. Cleaner, Stronger Threads
3. No Scrap Waste
4. No Separation from Chips

Hubbell Cold Heading may provide equally dramatic results for you. Whether it is presently cold headed or not, send blueprint of part or sample for analysis and estimate.

HARVEY HUBBELL, Inc. *Machine Screw Dept.*
Bridgeport 2, Connecticut

Kindly estimate on the enclosed
Sample (Blueprint). Quantity _____

Name _____
Title _____
Company _____
Address _____

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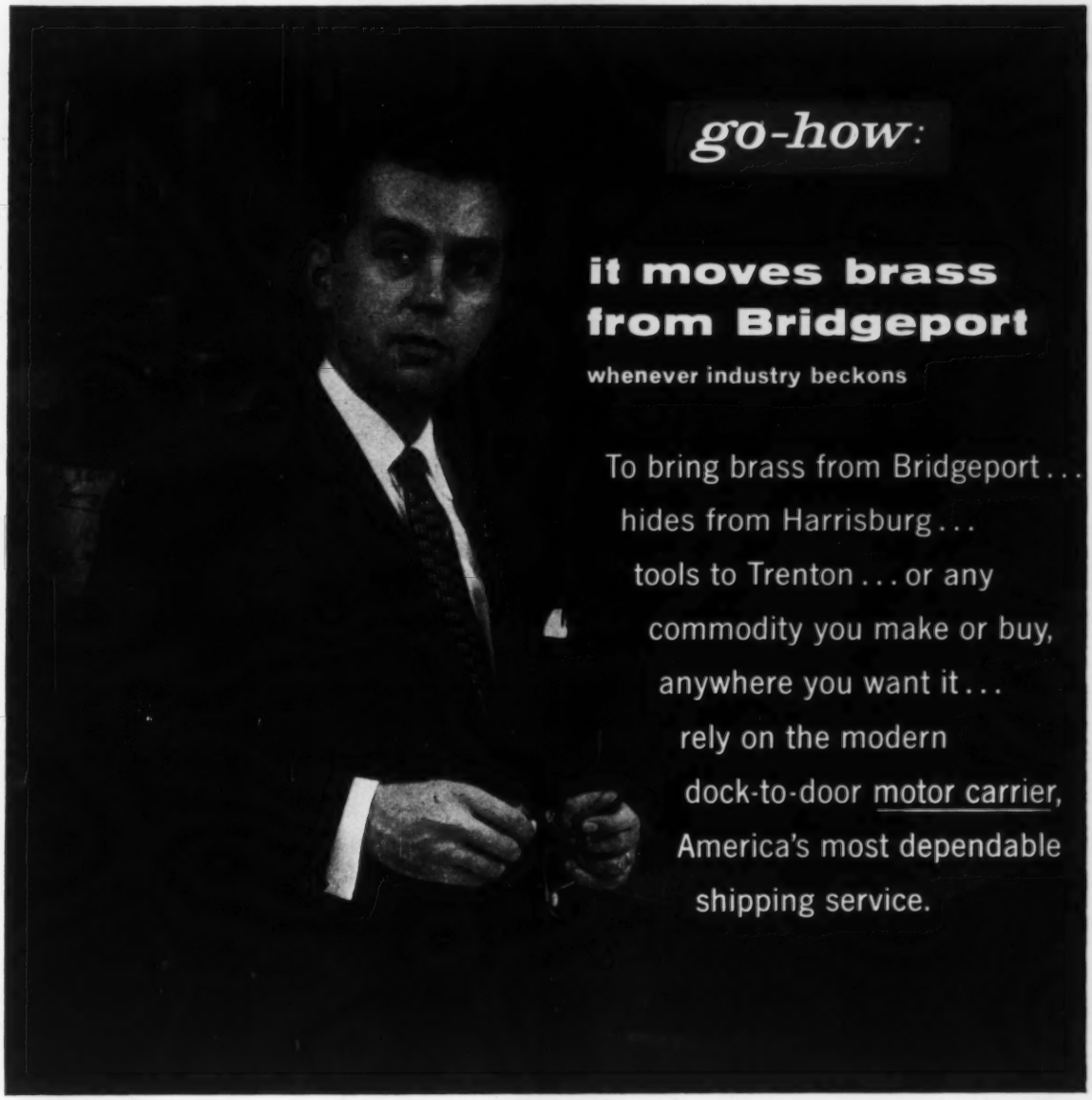
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it moves brass
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whenever industry beckons
To bring brass from Bridgeport . . .
hides from Harrisburg . . .
tools to Trenton . . . or any
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Martin P6M SeaMaster employs Republic Titanium

FOR STRENGTH, HEAT-RESISTANCE, WEIGHT-SAVING

The P6M SeaMaster is being built for the Navy by The Martin Company, Baltimore, Maryland. The attack seaplane is designed for minelaying and photo-reconnaissance. Photo shows a titanium center beam used in each engine nacelle.

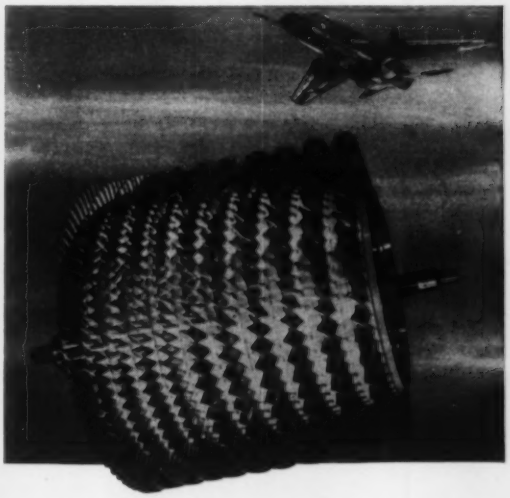
Two factors enabled The Martin Company to smooth the way for rapid, economical transition from design and development to production and delivery of the SeaMaster. First, was far-sighted planning on the prototype. Second, was utilization of the latest engineering principles, production concepts, and materials, including Republic Titanium.

Employing commercially pure titanium and titanium alloys, the SeaMaster contains more than 500 titanium details. The largest is a formed sheet metal bulkhead measuring 30″ by 45″—probably the largest detail ever formed from titanium at the time it was produced.

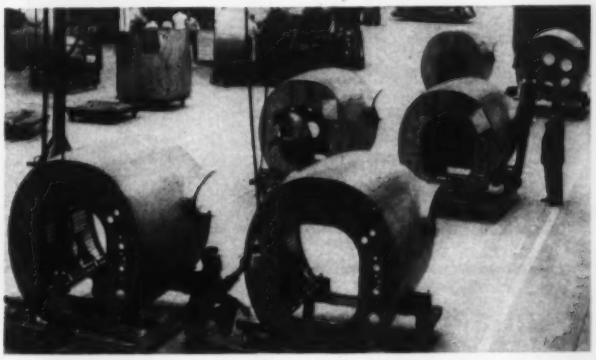
Commercially pure titanium and titanium alloy types supplied by Republic are used for strength, heat-resistance, and weight-saving. The titanium alloys are among the strongest now being produced and offer high strength values at elevated temperatures. In fact, titanium alloys provide the highest strength-to-weight ratio of any construction metal.

Many types of metals are required to meet the varied requirements of both aircraft and missile manufacturers. Metals to resist heat and corrosion, to reduce weight, to add strength. Production of these flight weight metals is a Republic specialty.

Republic metallurgists and engineers are always available to work with your personnel in developing the most advantageous use of Republic Titanium, Stainless Steels, and Alloy Steels. The coupon is your invitation to use this obligation-free service.



REPUBLIC ALLOY FORGING STEELS meet designers' requirements for operating and structrual parts that must be free from excess weight, yet tough and strong to withstand shock, impact, stress, and fatigue. In these quality steels are found the highest strength values—plus an exceptionally high strength-to-weight ratio that permits the use of thinner, lighter sections to save weight and hold down size without sacrifice of strength or safety. These essential qualities were the basis for selection of Republic Hot Rolled AMS 6415 (AISI 4340) for compressor rotor discs in jet engines. The discs are machined from forgings by the Tapco Group, Thompson Ramo Wooldridge Inc. Forgings were supplied by Wyman-Gordon Company.



REPUBLIC ENDURO STAINLESS STEELS, Types 301 and 302, are used by Solar Aircraft Company in fabricating complete nacelles for Navy P2V patrol bombers. Stainless construction offers a number of advantages including less maintenance for protection against corrosion, greater strength, ability to withstand high temperatures, the use of lighter gages to save weight. These types are readily formed into desired shapes by the usual commercial methods.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. ST -7273
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Have a metallurgist call:
☐ Titanium ☐ Stainless Steel ☐ Alloy Steel

Send more information on:
☐ Titanium ☐ Stainless Steel ☐ Alloy Steel

Name_____ Title_____

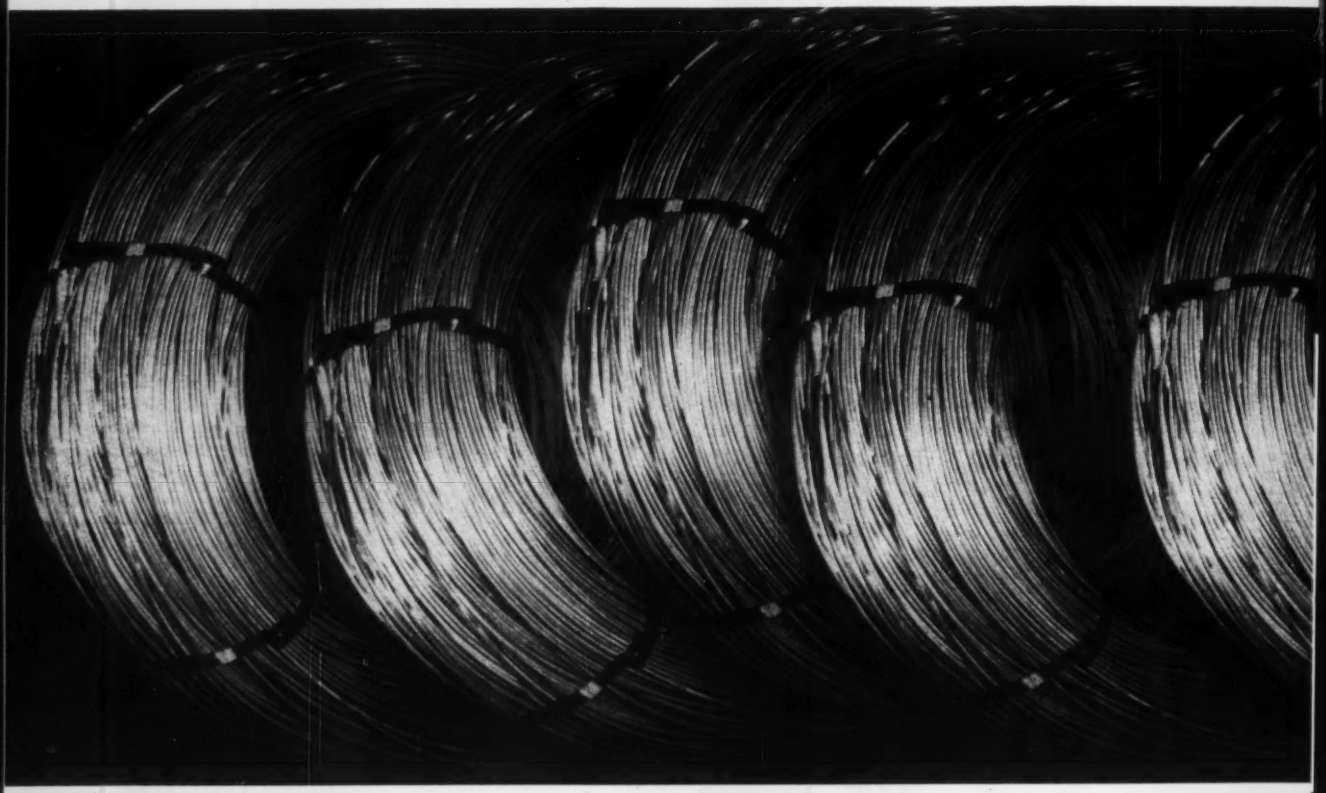
Company_____

Address_____

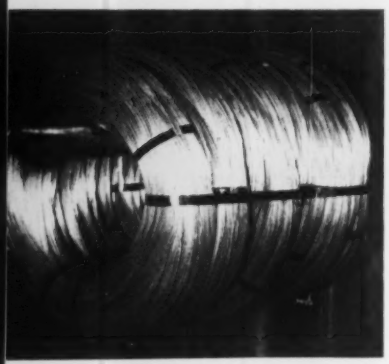
City_____ Zone____ State_____

Save down time... save handling

order your wire in AS&W



Other important time- and space-saving AS&W

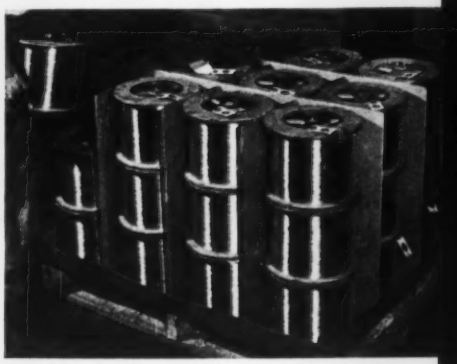


UNITIZED COILS

Several regular mill coils bound in one unit to speed up handling and save storage space. Unitized coils carry no price extra!

PAY-OFF DRUMS

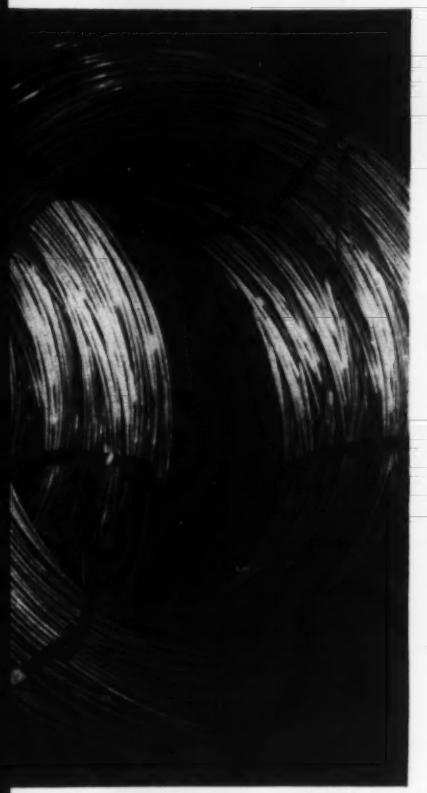
Large, fibre, disposable drum containing long continuous coil. Pay-Off Drum is easy to handle and stack, protects wire finish from dirt and corrosive atmospheres.



DISPOSABLE SPOOLS

Contain from 5 to 65 pounds of fine wire. These non-returnable spools are convenient to handle and stack. Where wire is needed in large quantities, they can be shipped 36 spools on a pallet.

time . . . save storage space . . .
NEW HEAVYWEIGHT COILS



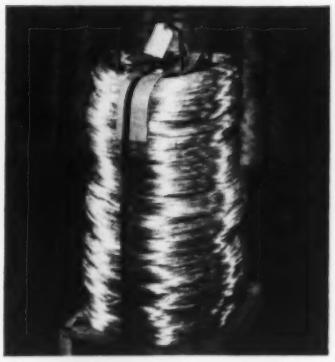
These large coils of continuous wire—up to 2,000 pounds—are designed by American Steel & Wire to help speed up your plant operation, increase your production—at no extra increase in wire cost.

With these large coils in place of regular mill coils, your machines stay in operation much longer, thus reducing down time costs. You save on handling time. You have only one wire coil to move in place of several. You save on storage space. One large coil takes up less room than several smaller ones.

FOR MILLS: Where Heavyweight Coils are not practical, American Steel & Wire supplies Manufacturers Wire in a variety of other time- and space-saving packages.

USS American Manufacturers Wire

Wire Packages:



PLATFORM COIL CARRIER

Made of U-shaped wire frame attached to deck platform; holds up to 3,000 pounds of wire in continuous lengths.

All of these new American Steel & Wire Packages are planned to serve you better, to help you use warehouse space to better advantage, to save time and money.

For more information, get in touch with the nearest district office of American Steel & Wire. General Offices: American Steel & Wire, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

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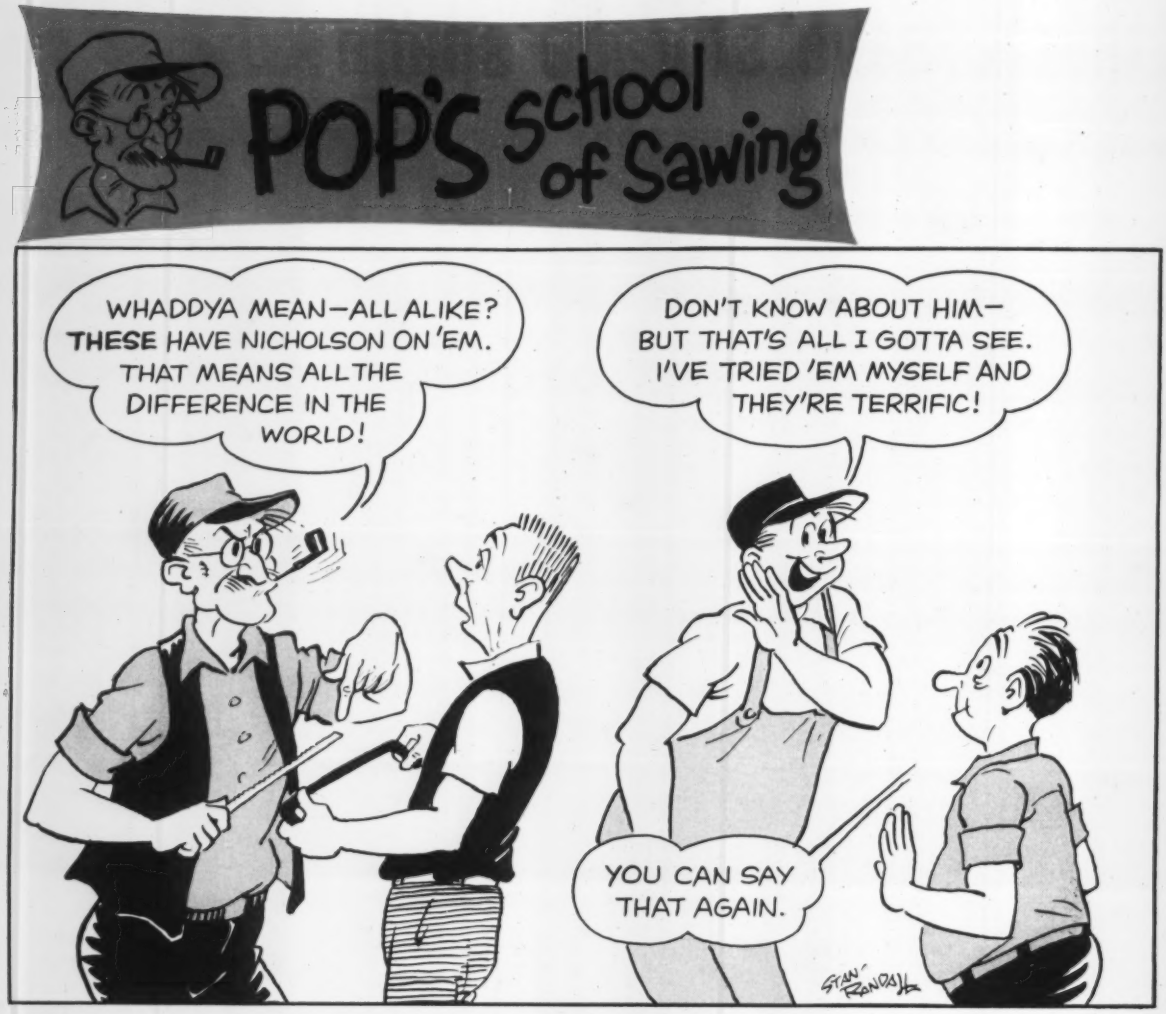

POP'S school of Sawing
WHADDYA MEAN—ALL ALIKE? THESE HAVE NICHOLSON ON 'EM. THAT MEANS ALL THE DIFFERENCE IN THE WORLD!
DON'T KNOW ABOUT HIM— BUT THAT'S ALL I GOTTA SEE. I'VE TRIED 'EM MYSELF AND THEY'RE TERRIFIC!
YOU CAN SAY THAT AGAIN.
STAN RANDALL

NICHOLSON U.S.A. **NICHOLSON** NF1016 10" x ½" x .025 **FLEXIBLE HIGH SPEED**

At last you can tell what a hacksaw or band saw blade will do just by looking at it. You know you can expect outstanding performance and low cost—when you see a Nicholson trademark.

These are the things Nicholson trademarks have always meant. These are the reasons the Nicholson and Black Diamond names are respected and wanted.

Save metal cutting time and costs. And increase your production. Standardize on Nicholson Hand and Power Hacksaw Blades and Nicholson Band Saw Blades. Black Diamond Hand Hacksaw Blades also are available.

Selected Distributors now offer these new Nicholson and Black Diamond Blades. Ask to test the types you use.

Industrial Distributors provide the finest goods and services in the least possible time. Our products are sold exclusively through them.

NICHOLSON METAL SEPARATING BLADES ARE AVAILABLE IN THESE TYPES

HAND HACKSAW BLADES

Flexible High Speed Molybdenum	Standard Steel
All Hard Molybdenum	All Hard Standard
All Hard Tungsten	Special Shatterproof

POWER HACKSAW BLADES

Welded Edge Shatterproof	All Hard Molybdenum
Flexible High Speed Steel	All Hard Tungsten—18-4-1

BAND SAW BLADES

Magicut—Raker and Wavy Set · Hook Tooth · Skip Tooth

NICHOLSON U.S.A. **NICHOLSON** BLACK DIAMOND U.S.A.

Nicholson File Company, Providence, Rhode Island

FILES • ROTARY BURS • HACKSAW AND BAND SAW BLADES • GROUND FLAT STOCK • INDUSTRIAL HAMMERS

CALENDAR
OF MEETINGS

Apr. 6-8, American Hot Dip Galvanizers Association Inc.: Annual meeting, Empress Hotel, Miami Beach, Fla. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

Apr. 6-8, Metallurgical Society of AIME: Annual conference of the national open hearth steel committee and the blast furnace, coke oven, and raw materials committee, Sheraton-Jefferson Hotel, St. Louis. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Apr. 6-10, American Welding Society: Welding show and technical meeting, International Amphitheatre and Sherman Hotel, Chicago. Society's address: 33 W. 39th St., New York 18, N. Y. National secretary: Fred L. Plummer.

Apr. 7-8, Building Research Institute: Annual meeting, Penn-Sheraton Hotel, Pittsburgh. Institute's address: 2101 Constitution Ave., Washington 25, D. C. Technical secretary: Harold Horowitz.

Apr. 8-9, Malleable Founders' Society: Market development conference, Wade Park Manor Hotel, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Apr. 8-10, National Industrial Conference Board Inc.: Annual conference on atomic energy in industry, Hotel Statler-Hilton, Cleveland. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Apr. 12-17, National Association of Architectural Metal Manufacturers: Annual meeting, Monteleone Hotel, New Orleans. Association's address: 228 N. LaSalle St., Chicago 1, Ill. Executive secretary: William N. Wilson.

Apr. 13-17, American Foundrymen's Society: Annual meeting and engineered castings show, Sherman and Morrison Hotels, Chicago. Society's address: Golf and Wolf Roads, Des Plaines, Ill. General manager: W. W. Maloney.

Apr. 13-17, American Management Association: National packaging exposition, International Amphitheatre, Chicago. Association's address: 1515 Broadway, New York 36, N. Y.

Apr. 14-15, American Institute of Electrical Engineers: Conference on electric heating, Bellevue-Stratford Hotel, Philadelphia. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Feature for feature. Price for price...*

CINCINNATI 16" ROYAL DRILL

is your BEST DRILLING BUY!

CHECK LIST FOR DRILLING AT A PROFIT

SPINDLE ACCURACY Bearings at TOP and bottom of spindle pulley.

BUILT-IN ELECTRICS Conveniently located in the head.

POSITIVE DEPTH GAGE Quickly set for positive stop.

RAPID SPEED CHANGE Five spindle speeds.

SPACIOUS TABLES Unusually wide work range.

ACCESSORIES and attachments

The CINCINNATI 16" ROYAL Drill is a real metalworking drill, built to machine tool quality standards by a machine tool builder. This is a multi-purpose machine—it handles light drilling on a production basis, as well as being ideal for utility operations. With CINCINNATI quality built-in, a ROYAL holds its accuracy longer—stays on the job longer.

* Only $128 for the Cincinnati 16" Royal bench type drill shown. Complete with 0"—½" chuck or #2 M.T. spindle, built-in single phase manual control with overload protection—less motor. Floor model, as above, only $143.

ROYALS are built in bench and floor types, single and multiple spindle 16" models with ⅝" drilling capacity in cast iron. Also 18" models with 1" capacity in cast iron.

Talk it over with your CL&T Dealer, or write us direct.

Improved Machining Through Research

CINCINNATI LATHE AND TOOL CO.

3210 Disney Street • Cincinnati 9, Ohio

"TRAY-TOP" Lathes • "CINCINNATI" Drilling Machines
"SPIROPOINT" Drill Sharpener

FRASSE ALUMINUM

helps tell how she's doing!

Ballistic missile success hinges on intelligence obtained in test firings. Tracking data – reporting velocity, direction, altitude, temperature, etc. is vital – when processed, it guides critical design changes.

Heart of the intricate data processing system at Cape Canaveral is a Potter Magnityper – a high speed electronic printer that decodes raw material... then stores, collates, interprets and prints at 72 *thousand* characters per minute. Lightweight, non-magnetic aluminum is essential to its efficient operation – that's why the Magnityper is made almost completely of Frasse aluminum.

Frasse ships the required sizes quickly from stock – in the grades that contribute to its ease of fabrication *and* performance. For example, Frasse supplies 2024-T4 bars for *strength* and *machinability*, 5052-H34 sheet for *formability* and *weldability* and "775" tooling plate for *dimensional accuracy* with *no distortion when worked.*

Perhaps these same qualities can increase the efficiency of *your* product – or reduce fabricating costs. It's worth investigating – and a Frasse aluminum specialist will be glad to help. There's no obligation – simply write or call your nearest Frasse office. You'll be glad you did.

Call FRASSE for ALUMINUM

Screw Machine Stock • Bars • Rods • Wire Sheets • Plates • Tubing • Holobar Pipe • Fittings • Valves • Extrusions Tool and Jig Plate

Peter A. Frasse & Co., Inc.

NEW YORK 13, N. Y.	PHILADELPHIA 29, PA.	BUFFALO 7, N. Y.	SYRACUSE 1, N. Y.	HARTFORD 1, CONN.
17 Grand St.	3911 Wissahickon Ave.	P. O. Box K, Sta. B	P. O. Box 1267	P. O. Box 1949
WAlker 5-2200	BAldwin 9-9900	BEdford 4700	HOward 3-8655	JAckson 9-6861

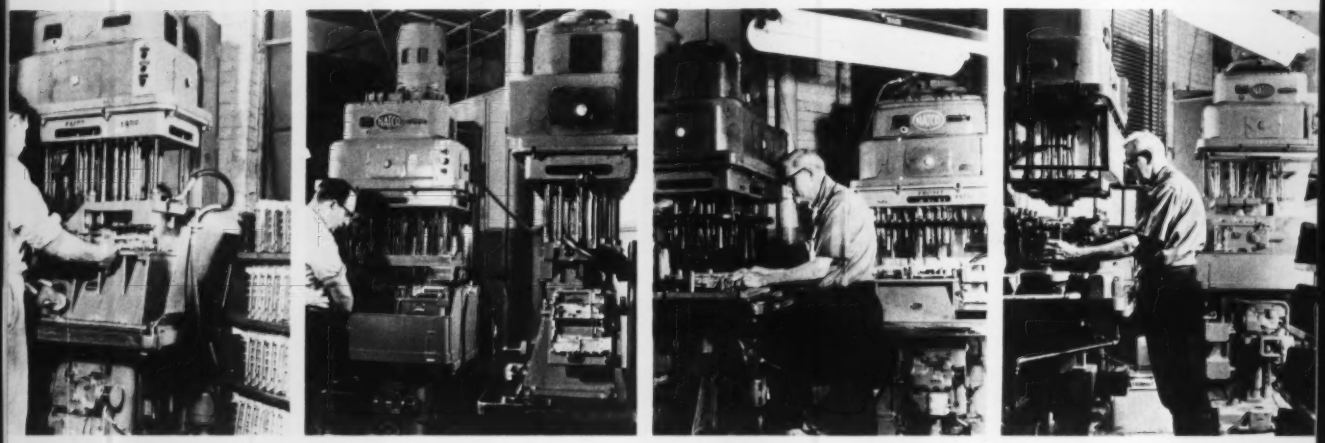
"Let the model change.
These high-production Natcos are ready."

. . . *says Dictaphone Corporation*

(complete story other side)

Five parts for the cost of one!

Fast changeover too!



These 7 standard Natcos do it for Dictaphone!

Costs toppled 81%, savings exceeded $1.00 per part when Dictaphone Corporation, Bridgeport, Conn., switched from gang drill production to this line of seven high-production H-6 Natcos. *Standards*, not specials. They quickly convert when models change; and replacement parts for old models can be run on the same line with minimum time for changeover.

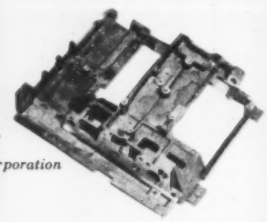
Dictaphone's part is a magnesium main frame for its Time-Master dictating machine. It calls for drilling 97 holes and performing 150 secondary operations—reaming, tapping, counterboring and countersinking on most of them. The seven multi-spindle Natcos handle all but 16 of these operations.

Besides increasing production 81 per cent, the seven Natcos eliminate skipped and creeping holes, and maintain close tolerances. Natco tooling locates the magnesium parts without warping stresses.

On the Natco H-6, the slip plate is the key to flexibility. For example, Dictaphone transferred four Natcos from other assignments, simply by fitting them with new slip spindle plates and, of course, new fixtures. Three new Natcos filled out the line.

Natco H-6 and other multi-spindle drilling machines are available in models from 1 hp with 10 spindles to 50 hp with up to 72 spindles. Write today for complete details or see your Natco representative.

Under the cover of
the Time-Master *,
. . . profits in 97 holes.

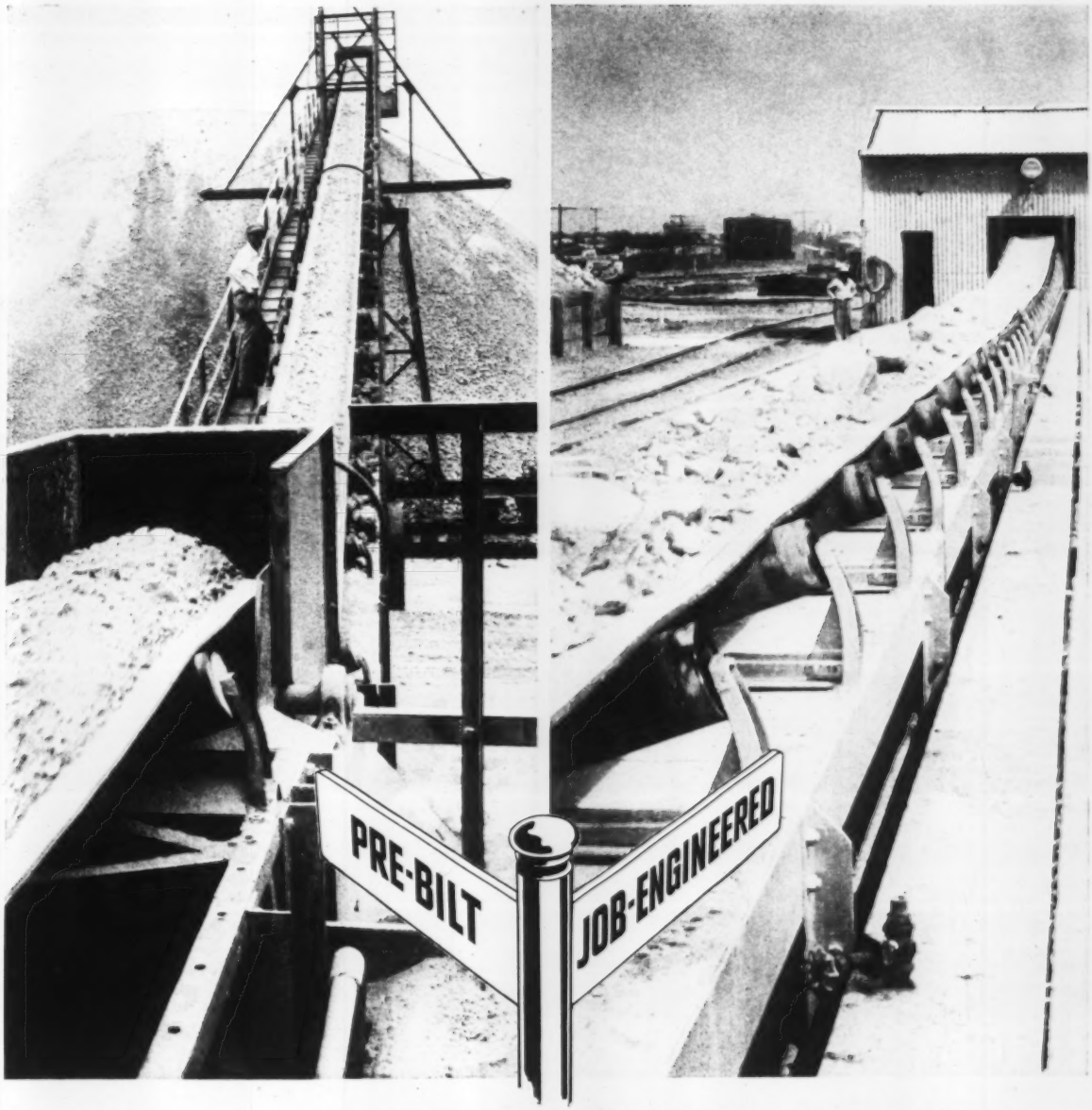


*Registered trademark of Dictaphone Corporation

NATCO

NATIONAL AUTOMATIC TOOL COMPANY, INC., RICHMOND, IND.

Choose your route to lower handling costs



Modernize for greater profit with a LINK-BELT belt conveyor system

BELT conveyors have proved themselves the giant of industry for low-cost, bulk materials handling. And additional benefits offered by Link-Belt contribute even more to this inherent economy.

LINK-BELT PRE-BILT SECTIONAL BELT CONVEYORS are pre-engineered . . . avoid need for detailed drawings. From standardized data, Link-Belt engineers prepare "on-the-site" quotations. Interchangeable, standardized parts speed selection, reduce purchasing costs.

LINK-BELT JOB-ENGINEERED BELT CONVEYORS. As a single source for design, equipment and erection of these systems, Link-Belt spares you coordination problems involving drawings and equipment . . . prevents waste of your engineering manhours.

For full details on both types of conveyors, contact your nearest Link-Belt office. Ask for 40-page Pre-Bilt Catalog 2779. 15,022

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

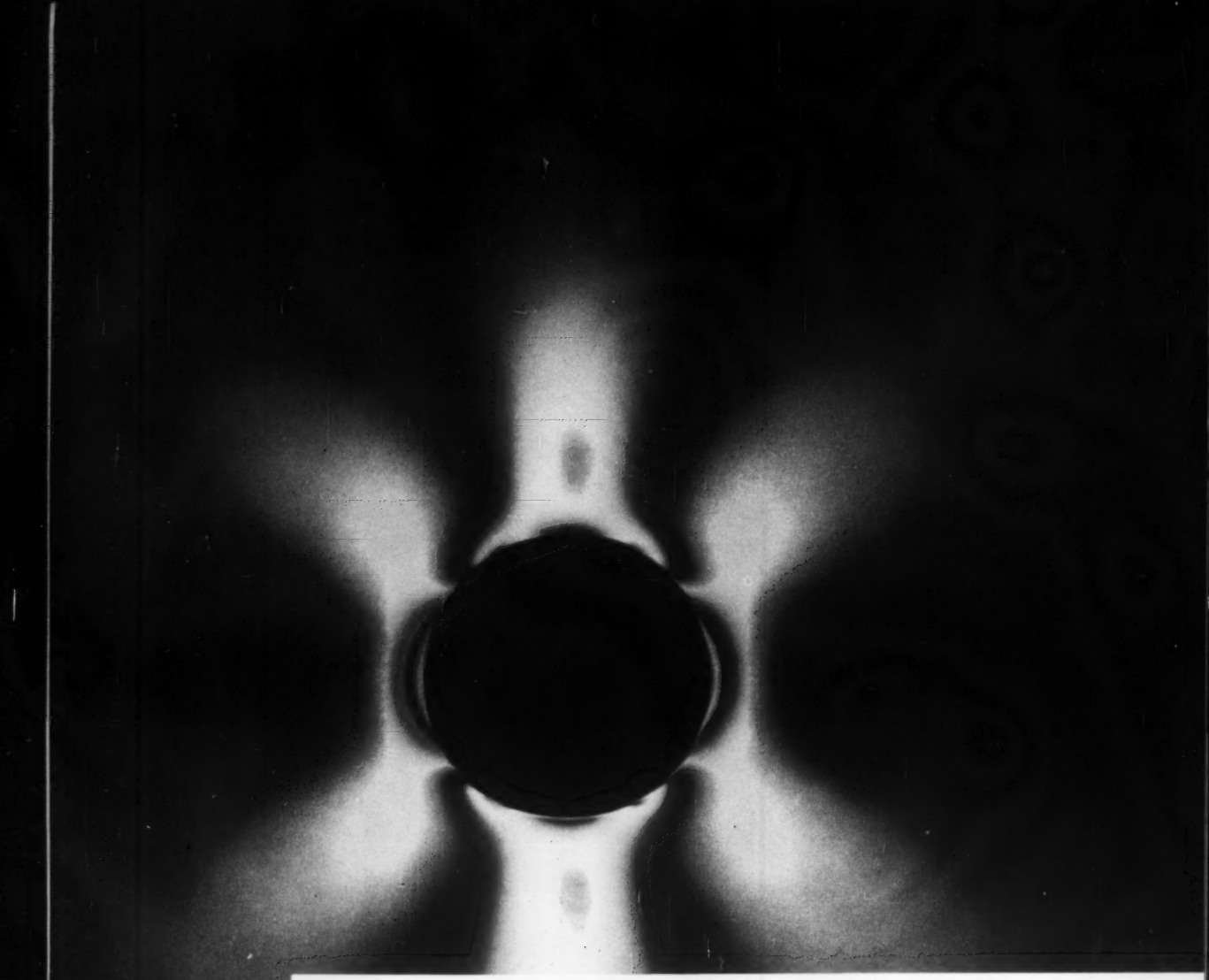


Photo-elastic stress patterns produced by models photographed with polarized light are one of the modern analytic tools available for ever-increasing perfection of Malleable iron castings.

Strength is Malleable

The strength crucial in spiraling the heave of diesels' pistons into unresistible power, in protecting lives as automobiles hurtle down endless highways, and in every link of chain that swings massive loads overhead, is yours to mold into tomorrow's dynamic engineering achievements with Malleable iron castings. Yet Malleable provides this strength in combination with toughness, producibility and economy that makes Malleable castings the finest, most versatile metal available.

For information or service, call on one of the progressive firms that identify themselves with this symbol—

MEMBER
MALLEABLE
CASTINGS COUNCIL

If you wish, you may inquire direct to the Malleable Castings Council, 1800 Union Commerce Building, Cleveland 14, Ohio, for information.

These companies are members of the

MALLEABLE CASTINGS COUNCIL

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Link-Belt Company, Indianapolis 6
Muncie Malleable Foundry Co., Muncie
Terre Haute Mall. & Mfg. Corp., Terre Haute

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW JERSEY
Meeker Foundry Company, Newark 4

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Canton Malleable Iron Co., Canton 5
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

WISCONSIN
Badger Malleable & Mfg. Co., S. Milwaukee
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

How to Get More Strength Per Dollar with Malleable Castings

With few exceptions, strength is the most important single design requirement for a metal part. But in the commercial production of that part, the ultimate objective is to manufacture it at the lowest possible cost. Malleable iron castings take advantage of many factors to provide the greatest strength per dollar of any ferrous or non-ferrous metal.

Great Strength Range Available

From the wide range of standard (ferritic) and pearlitic Malleable irons available, a type may be selected that meets strength requirements ranging from 50,000 p. s. i. to 120,000 p. s. i. tensile.

Table No. 1 shows these strength values and other physical measures for 9 grades of Malleable. Note particularly how high yield strengths are in comparison to tensile strengths. Because yield strength is generally the measure of usable strength, this is especially important.

Also important is the uniformity of Malleable's strength. The heat treatment given all Malleable castings produces a unique metallurgical combination of strength, ductility, machinability and impact resistance. At the same time, it relieves internal stresses so that Malleable's strength cannot be machined away, nor will it be present in some parts but missing in others.

TABLE No. 1
TENSILE PROPERTIES—
A.S.T.M. MINIMUM SPECIFICATIONS

Standard and Pearlitic Malleable Irons

Designation	Tensile Strength p. s. i.	Yield Strength p. s. i.	Ratio of Tensile to Yield %
Standard			
35018	53,000	35,000	66
32510	50,000	32,500	65
Pearlitic			
45010	65,000	45,000	69
45007	68,000	45,000	66
48004	70,000	48,000	69
50007	75,000	50,000	67
53004	80,000	53,000	66
60003	80,000	60,000	75
80002	100,000	80,000	80

Strengths up to 135,000 p.s.i. tensile and 110,000 p.s.i. yield are produced commercially under individual producers' specifications.

Economy Due to Multiple Factors

Malleable's superior strength-cost ratio is due to a combination of the casting process, which puts the metal where you want it, and the inherent economy of Malleable iron. Also, whenever machining operations are involved, Malleable castings cut finished costs significantly. Being the most easily machined of all ferrous metals of similar hardness, the cost of the finished part can often be reduced to less than that of metals which cost less in the semi-finished stage.

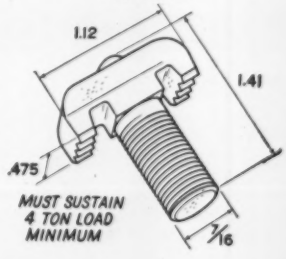
Malleable Provides Strength Plus Other Advantages

The T-bolt shown in Fig. 1 is used to assemble steel channel frames. Small but mighty, these 7/16″ bolts hold 4 ton loads. The tensile strength requirements are 90,000 to 100,000 p. s. i., yet ductility must be good and tolerances must be held to ±.005″ on the head width, and +.020″, —.000″ on the inside of the head.

In this application, pearlitic Malleable castings proved the only material consistently capable of sustaining loads over 8,000 pounds and meeting close tolerances in critical areas. At the same time, sufficient ductility was maintained to allow upsetting the spring retainer protrusion on the head.

The finished Malleable castings cost one third less than the next most satisfactory material. For both dynamic and static applications, today's Malleable castings are truly one of industry's finest engineering materials.

Fig. No. 1



Write for Free Data Unit

Data Unit 102-Strength, more fully describing Malleable's strength characteristics, is available for use by materials specifiers and users. For your copy, contact any member of the Malleable Castings Council or write to Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

Howard Beacham tripled wheel life,

Howard Beacham has been a Bay State Abrasive Engineer for fifteen years and his total experience is double that. He's worked on grinding problems that have involved every type of metal in jobs as tiny as miniature bearings and as big as the world's largest air compressors and steam turbines.

cut dressing frequency in half at New Process Gear

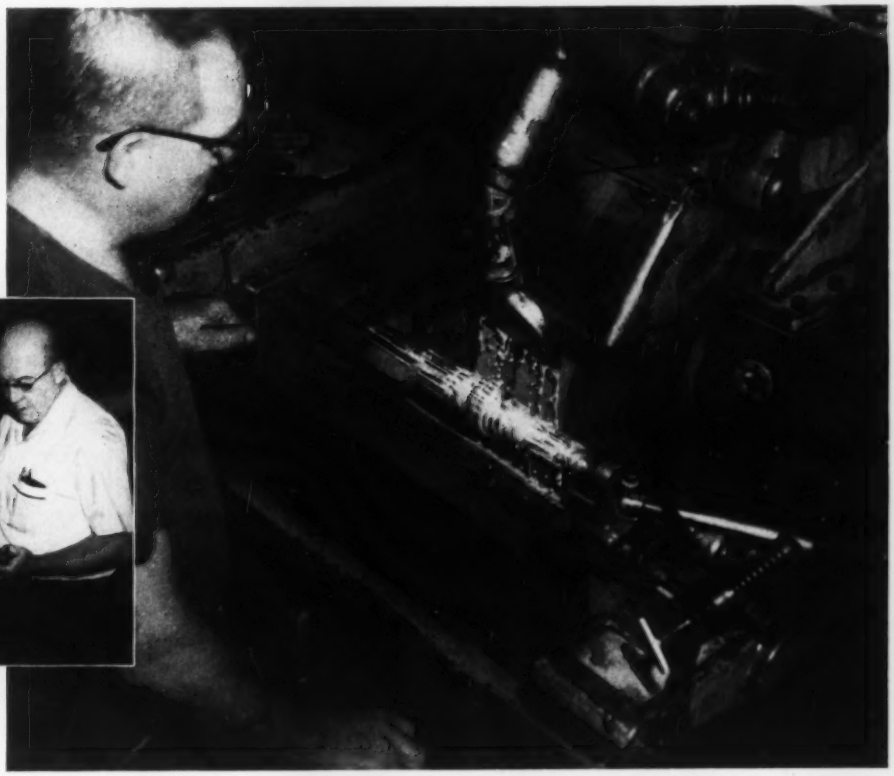
The closer you get to automation, the more it hurts to have production interrupted. That was the principal problem at Chrysler's New Process Gear Division where semi-automatic grinding of flats on truck transmission shafts was halted by wheel dressings every eleven pieces.

The three competitive wheels used in this simultaneous "cam grinding" operation wore down so fast they had to be replaced every week. And, on top of that, an alarming number of shafts were being cracked during the grinding operation.

Bay State's Howard Beacham was called in on the job. He specified a trio of Bay State wheels that produced really spectacular results.

Production jumped to twenty-five perfect shafts per dressing and wheel life went up to three full weeks. Finish was excellent, too.

Why not talk to your own Bay State representative next time you have a grinding problem? Like Howard Beacham he's a trained specialist. *Better grinding at lower cost . . . that is his business.*



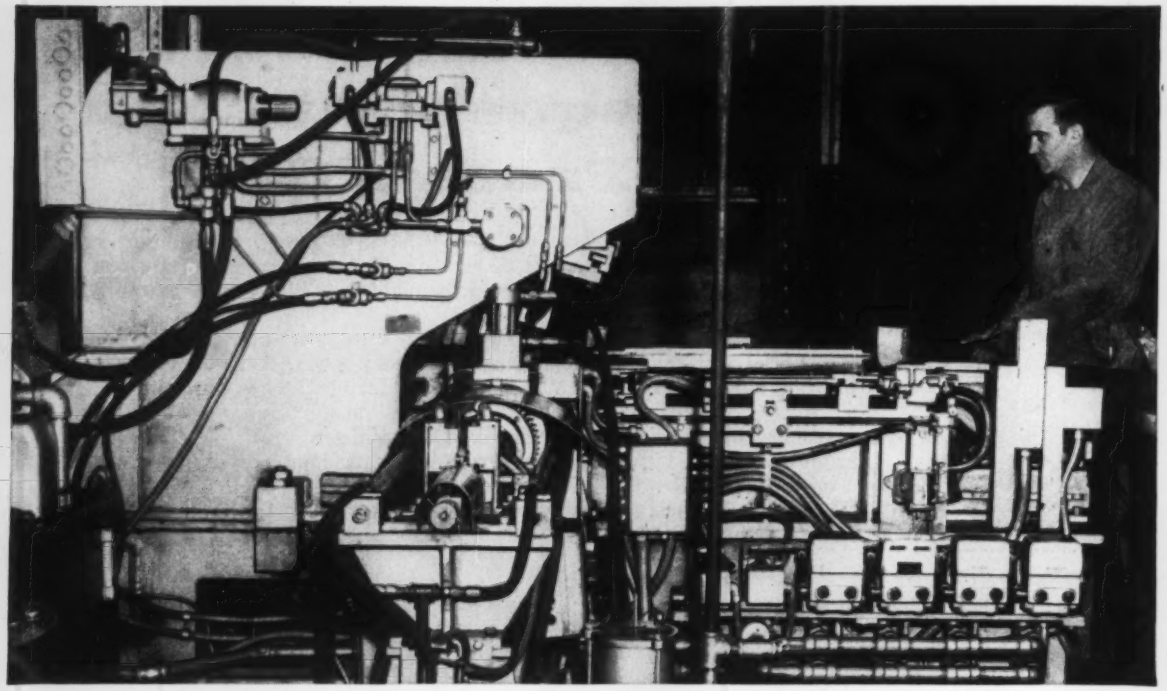
Operator Henry Kotas runs grinder equipped with one 24 x 1-21/32 x 12 and two 24 x 1-3/4 x 12 Bay State wheels. The three wheels simultaneously grind flats on main shaft for 5-speed truck transmission.

(*Above*) Manufacturing Engineer Wiley Bell and Plant Superintendent Nelson Fisk examine finished truck transmission shaft.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.



This machine rolls and welds muffler shells. Hydraulic pressure and return lines are Aeroquip Flexible Hose Lines which replaced rigid tubing.

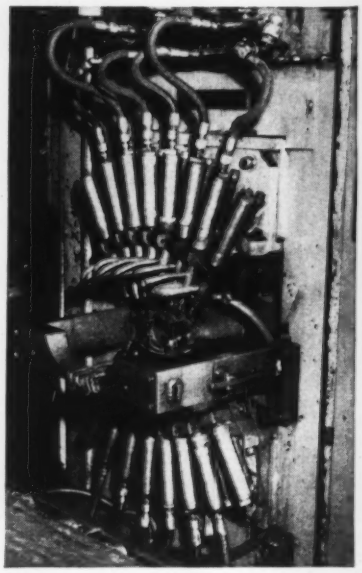
Hydraulic Line Leakage Problems Solved With Aeroquip Flexible Hose Lines

at Walker Michigan Division,
Walker Manufacturing Company of Wisconsin

Semi-automatic metal forming and welding equipment is used at Walker Michigan Division's Jackson plant in the production of automotive mufflers. On equipment using rigid tubing, leaking hydraulic lines were a common maintenance problem. Tubing failures were caused by vibration of the equipment during operation.

Walker maintenance men solved this problem by replacing rigid tubing with Aeroquip Flexible Hose Lines. Assembled quickly in the plant using Bulk Hose and Reusable Fittings, these replacement hose lines have given long, trouble-free service.

If you have a fluid line problem of any kind, you can rely on your local Aeroquip Distributor to help solve it. He's a fluid line specialist. Call him today, or write us.



Aeroquip Hose Lines on this multiple transformer welder have given long, leakproof service since replacing steel tubing. Walker maintenance men keep a supply of Aeroquip Hose and Reusable Fittings on hand to replace tubing when needed.

Aeroquip

REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

INDUSTRIAL DIVISION, VAN WERT, OHIO • WESTERN DIVISION, BURBANK, CALIFORNIA
AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

For Economy and Ease of Maintenance, Specify Aeroquip Reusable Fitting Hose Lines on New Equipment you Buy.

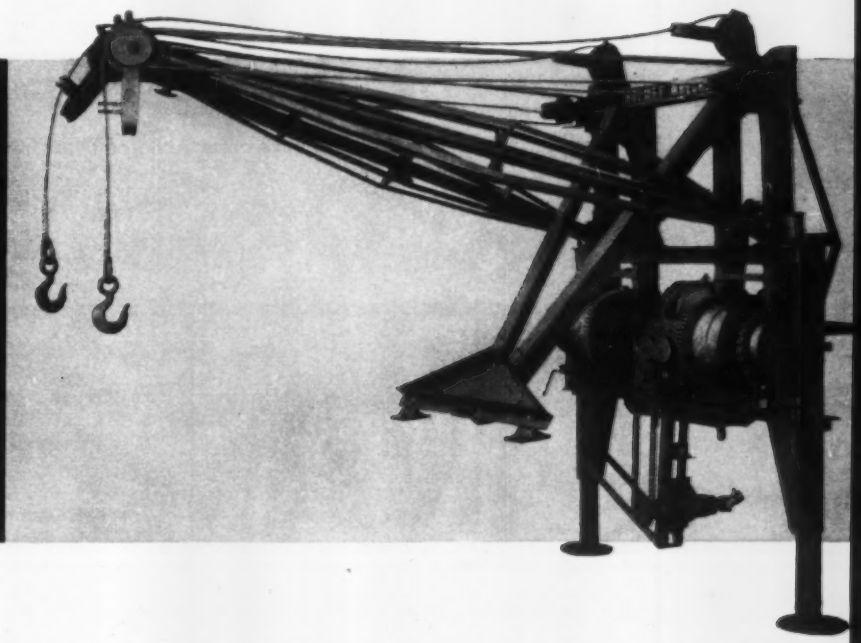
Accent on Excellence

Youngstown cold-finished bars

The *original* automobile wrecker, built many years ago by Ernest Holmes Company of Chattanooga, Tennessee, contained critical components fabricated from Youngstown Cold-Finished Bars. Today, this same high quality steel is being used to build strength into Holmes's up-to-the-minute wrecker designs.

These quality steel bars are drawn to precision tolerances. Finish is uniformly bright and smooth. Both chemical and metallurgical properties are rigidly controlled to meet today's most exacting specifications.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".



This new model unmounted Holmes wrecker unit provides an over-all lifting capacity of 18,000 pounds. It's shown mounted on a Ford chassis (small illustration) making a wrecker ideally suited for service in congested city areas.

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel

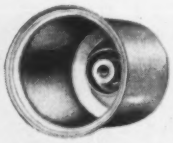
MUELLER BRASS CO. OFFERS 7 WAYS TO PRODUCE YOUR PART

Mueller Brass Co., because of its diversified manufacturing facilities that encompass a wide range of fabricating methods, is in the unique position of being able to offer you, the purchaser, an intelligent, unbiased analysis and recommendation of the best, most economical method by which your particular part can be produced. As the result of over 40 years' experience, the "Methods Analysis Department" has at its command complete knowledge of the advantages and limitations of each production process. After receiving detailed knowledge concerning the end use of the part, material specified, conditions under which it must operate and other pertinent factors, these analysis engineers make their recommendations. Every detail is considered. In many cases, methods analysis engineers recommend a simple design change that makes practical a much more economical method of production. This technical service, offered only by Mueller Brass Co., is given to each individual inquiry and is your assurance that you will get the best product at the best price . . . made the one best way . . . by Mueller Brass Co.

Send today for free technical literature on any one or all of the seven fabricating methods.

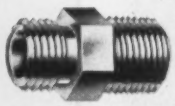
FORGINGS

Production equipment is available to produce press, hammer or cored forgings of any practical shape in sizes ranging from a few ounces to 150 lbs. in brass, bronze, aluminum and magnesium in 27 standard, as well as special, alloys.



COLD-PREST® IMPACT EXTRUSIONS

Mueller Brass Co. has complete machinery for producing Cold-Prest impact extrusions of aluminum, copper, brass, bronze and steel. Extrusions up to 28" in length are possible, depending on wall thickness and other design details. Parts can be designed having ribs, flutes, splines or bosses . . . with multiple wall diameters and with uniform or tapered wall sections.



SCREW MACHINE PRODUCTS

Mueller Brass Co. has one of the world's largest automatic screw machine departments fabricating both ferrous and non-ferrous custom parts. We can produce an infinite variety of shapes and sizes from ⅛" to 3¼" in wide range of free cutting and specialized alloys. Complete facilities for all secondary and finishing operations, as well.

POWDER METAL PARTS

Mueller Brass Co. can supply precision Sinteel® powder metal parts in wide range of sizes and metals at high production rate. Parts available from iron, brass and copper alloys. Parts may be ordered with such characteristics as self-lubrication, controlled porosity and good electrical and magnetic properties.

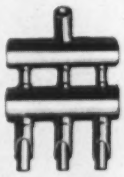
MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

MUELLER BRASS CO.

...and our methods analysis service helps you determine which is the best ...and most economical method

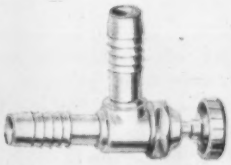
SAND CASTINGS

We specialize in the production of pressure-tight red brass castings. We utilize both metal match plate and wood patterns. Facilities include tool room and pattern shop, electric melting furnaces, high capacity core room and both bench and floor molding equipment to handle wide range of sizes.



FORMED COPPER TUBE

Mueller Brass Co. has modern facilities for forming seamless copper tube into a multitude of shapes. Forming methods used include bending, spinning, expanding or swedging, upsetting, flaring, flattening, beading and grooving, drilling and piercing, machining and joining. Formed copper tube coils are also available as single, double, spiral and serpentine shapes.



PLASTIC INJECTION MOLDING

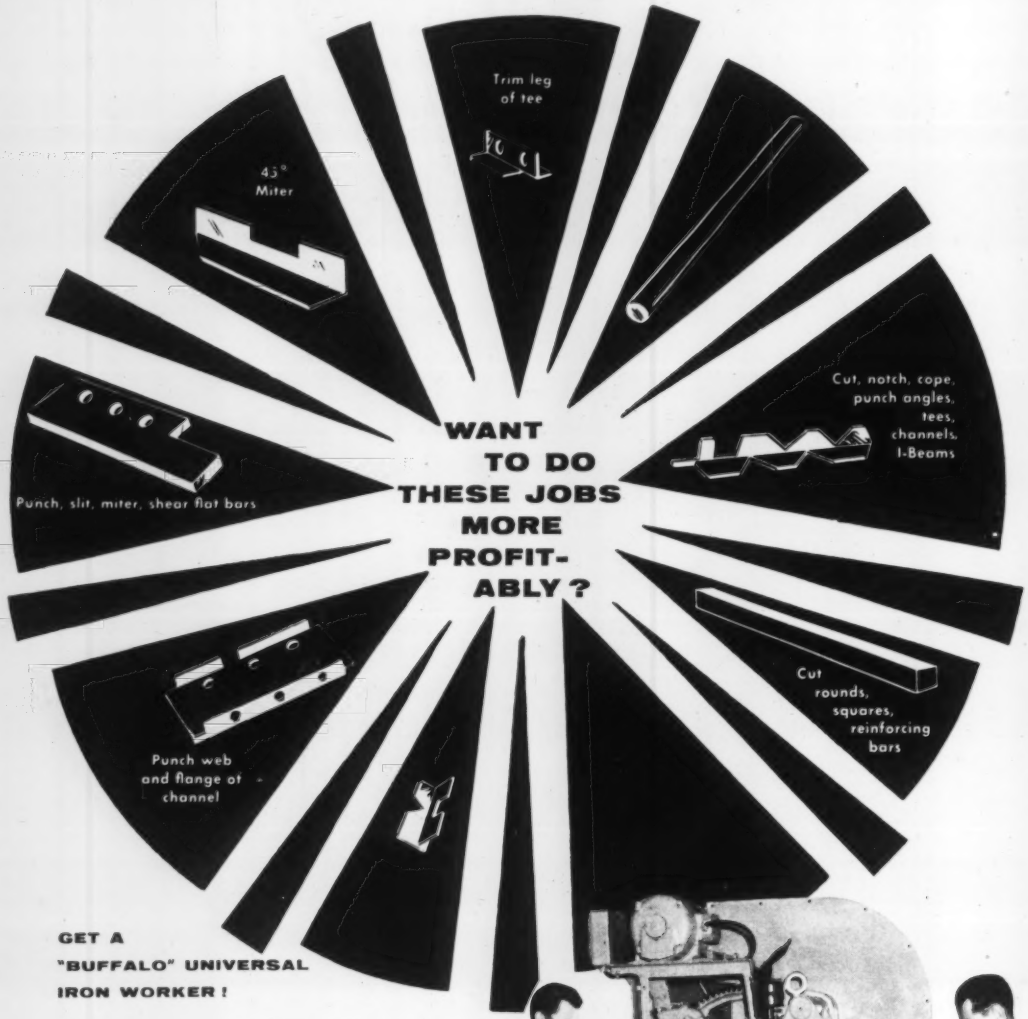
Injection molding of plastic parts is still another process offered by the Mueller Brass Co. Parts are molded from such plastics as—nylon, polyethylenes, polyvinyl chloride, styrenes, linear acetal, chlorinated polyether, polycarbonates or polypropylene, dependent on part application.

MAN FROM MUELLER BRASS CO.

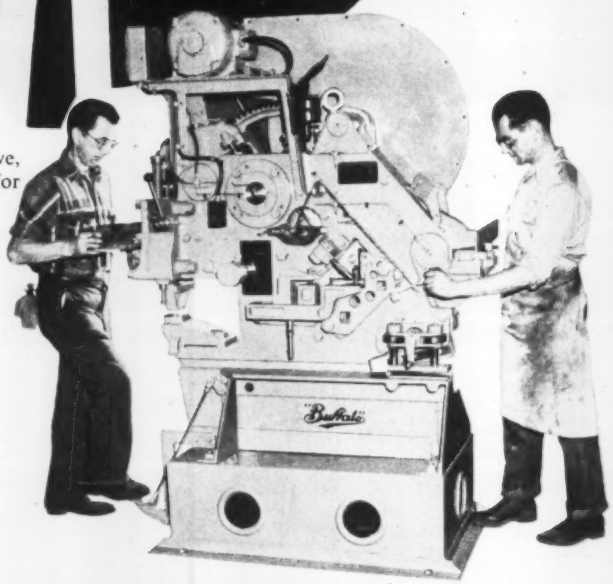
Since only Mueller Brass Co. can produce your part by all the methods, only the Man From Mueller Brass Co. can give sound advice on the one best method of production. Over 40 years of research, engineering, manufacturing and marketing experience stands behind him. When you are specifying and purchasing fabricated metal parts, call in the MAN FROM MUELLER BRASS CO.

271

PORT HURON 26, MICHIGAN


Trim leg of tee
45° Miter
Cut, notch, cope, punch angles, tees, channels, I-Beams
WANT TO DO THESE JOBS MORE PROFIT-ABLY?
Punch, slit, miter, shear flat bars
Cut rounds, squares, reinforcing bars
Punch web and flange of channel

GET A "BUFFALO" UNIVERSAL IRON WORKER!



If your shop does the type of fabricating jobs shown above, a "Buffalo" Universal Iron Worker will quickly pay for itself — and earn a healthy profit over many years of productive use.

The UIW occupies the space of only one machine, yet does the work of six. Performs two operations at once. No tool changes required. Easy to set up and operate. Long, maintenance-free life is assured by rugged arc-welded steel plate construction. One-shot lubrication system provides further dependability.

It will pay you to investigate the "Buffalo" Universal Iron Worker. See how it can cut production and maintenance costs and increase profits in your shop!

For complete information on the "Buffalo" Universal Iron Worker, contact your "Buffalo" machine tool dealer. Or write direct for Bulletin 360-G.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

158 MORTIMER STREET BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING

Good fabrication and welding properties of "T-1" Steel saved time and money in the shop and on location.

24 feet in diameter—the nation's largest turbine scroll cases. Built with USS "T-1" Steel for maximum strength with least weight.

Biggest turbine scroll cases built 50% lighter with USS "T-1" Steel

A turbine scroll case looks like a giant seashell. Through the conch, water gushes in an ever-tightening spiral into the blades of the water turbine. Pressures are enormous.

Four of these cases, the largest in the United States, have been fabricated from USS "T-1" Constructional Alloy Steel by the Chicago Bridge & Iron Company. They will harness the flow of the Clark Fork River in the Noxon Rapids Dam, a project of the Washington Water Power Authority.

USS "T-1" Steel was used for the cases because of its high minimum yield strength of 90,000 psi. (100,000 psi for non-code applications.) This permitted a reduction in plate thickness of about 50% with sizeable savings in welding costs, freight and foundation costs. Welding on the job was readily done and there was no need for stress relieving.

What USS "T-1" Steel can do for you.

USS "T-1" Steel is an extra strong, tough, weldable steel with high resistance to impact abrasion and corrosion. Both mobile and stationary equipment can be built bigger, stronger and more durable. Payloads can be increased and operating costs drastically reduced. Your products are worth more because they do more and save more when built of USS "T-1" Steel. For information about USS "T-1" Steel, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS and "T-1" are registered trademarks

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

USS

Down go back-up roll costs with

USS Quality Forged Sleeves

PICTURED ABOVE is James S. Rennick, a metallurgist with twenty years' experience in the Forgings Division of U. S. Steel. Jim specifies composition, heat treatment, and other processing procedures essential to the production of assemblies as shown in the main picture—a back-up roll that will be used in the cold reduction tin mill at U. S. Steel's Gary, Indiana plant.

This job points up a curious situation: U. S. Steel is one of the country's leading manufacturers of rolls, and also one of the biggest *users* of rolls . . . a double reason to perfect their performance and reduce their cost . . . just as we did here.

We had to replace a worn, cast steel back-up roll. Rather than replace the entire roll, we machined the face of the roll and shrunk on a *forged* steel sleeve. For back-up rolls like this one, 42" O.D. and larger, this method of sleeving is much less expensive than buying a complete new roll. One arbor can be used for several forged sleeves. A forged sleeve has a hard, wear-resistant surface and is highly resistant to spalling.

Also, the sleeve is purposely produced with a softer bore to develop a desirable stress pattern, and to provide maximum gripping between the arbor and sleeve after assembly.

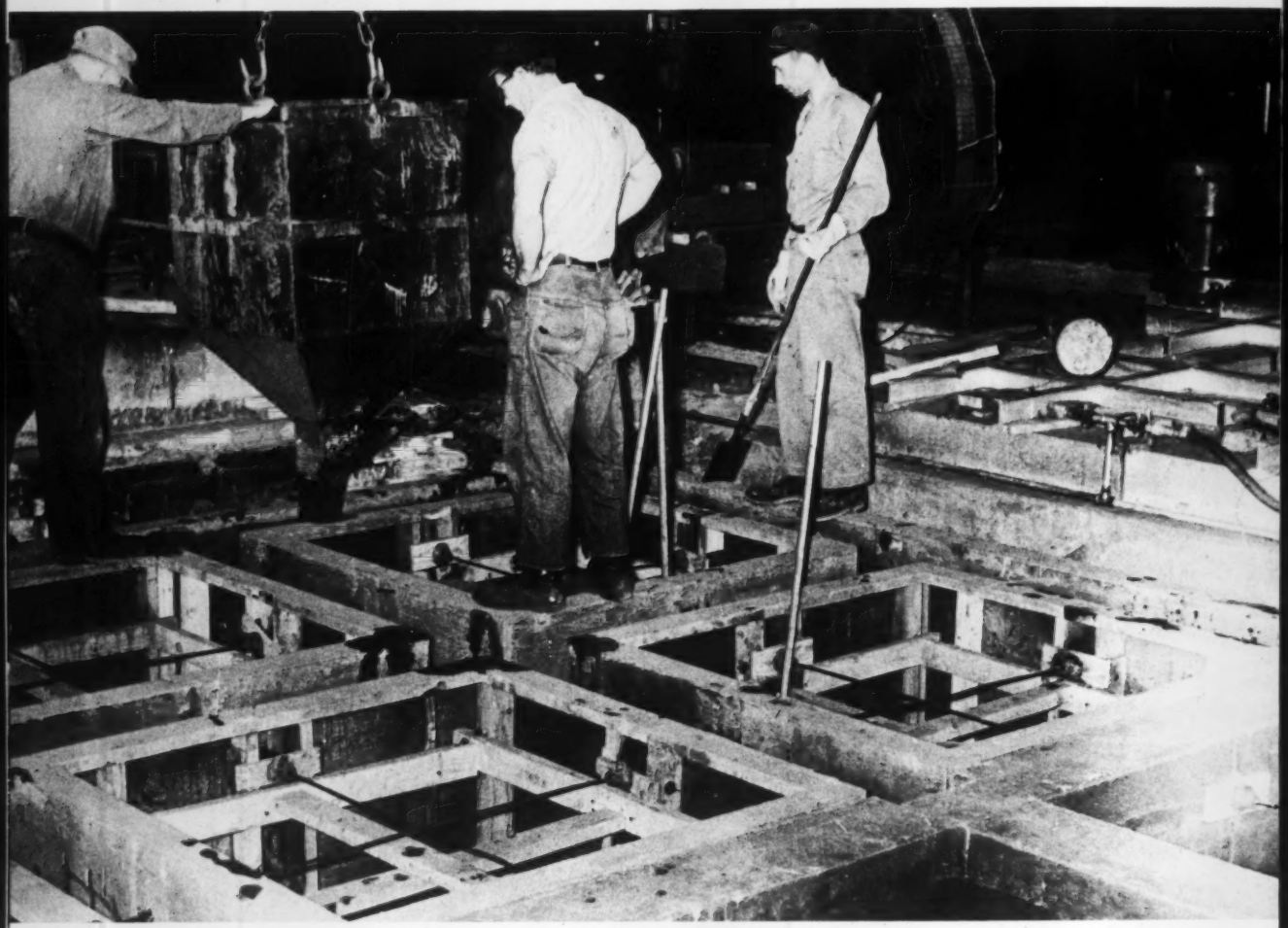
There is a good possibility that we can help reduce *your* roll costs. Write or call the United States Steel Office nearest you, or United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel

Slow-cooling pits cost less to build with refractory concrete made with Atlas Lumnite Cement



Vanadium-Alloys Steel Company, Latrobe, Pennsylvania, saved time and money by constructing slow-cooling pits with refractory concrete made with Lumnite calcium-aluminate cement. Using plant labor, 24 refractory concrete pits were formed in record time. With re-usable wood forms, material costs were greatly reduced. And procedures and equipment typical of any standard concrete construction work helped speed the job. The result was a smooth, jointless concrete pit that will resist thermal shock and wear and tear of charging and unloading hot alloy ingots.

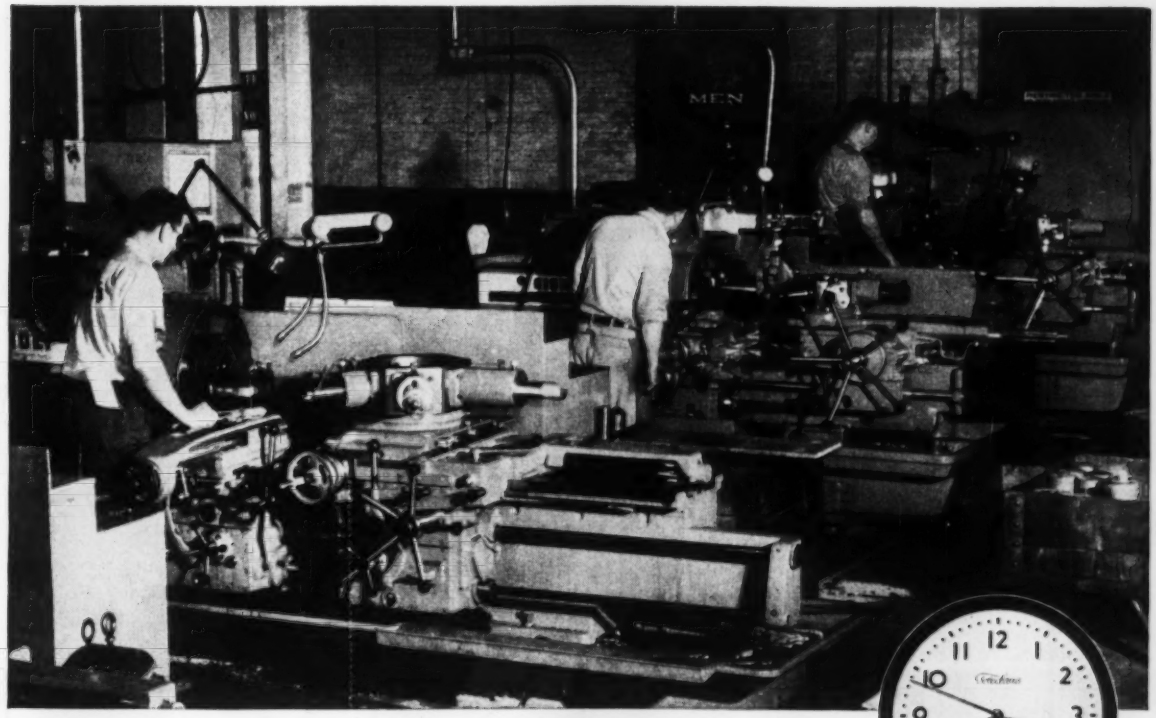
For added convenience and economy in refractory concrete construction, castables made with Lumnite cement are available. These are packaged mixtures, ready for use. Simply add water, mix and place. Made by leading manufacturers of refractories. For more information, write Universal Atlas, 100 Park Avenue, New York 17, N. Y.

"USS," "Atlas" and "Lumnite" are registered trademarks

L-180

Universal Atlas Cement
Division of
United States Steel

OFFICES: Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco



Are you getting your 19 minutes?

Recent studies prove the average manufacturer operates at a profit *only during the last 19 minutes of every working day.*

What happens to the rest of the day's output? According to the National Association of Manufacturers, it goes to pay the costs of doing business.

Think what this means to manufacturers attempting to produce profitably with obsolete equipment...with machining unavoidably representing a large part of the manufacturing cost.

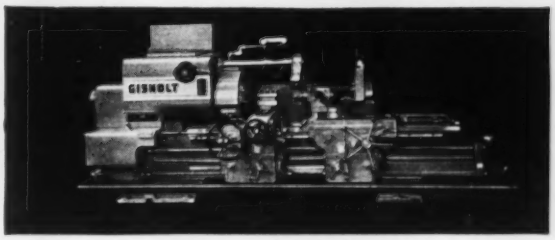
The thin line between profit and loss in your operation can well hinge on your taking advantage of modern, high-speed machine tools with ample power, reserve feeds and speeds, and maximum flexibility.

If you have obsolete equipment in your shop, now is the time to look at it closely and critically. The difference between the old and the new may amaze you. Find out now just how much obsolete machines are holding you back.

Why not call in your Gisholt Representative and talk it over with him? He'll give you fair and accurate appraisals of any machine's productive output. Call him today.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin

ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE



Gisholt MASTERLINE
Saddle Type Turret Lathe

Rugged headstock gear train provides 24 different forward speeds—all from a single-speed motor, for full power on all cuts.

Hydraulic speed selector permits effortless speed shifts without stopping spindle or shifting gears.

Here's a rugged, powerful machine that delivers maximum output and accuracy from today's carbide tools—and has ample reserve to meet tomorrow's tooling requirements.

Contact your Gisholt Representative today for full details.

Gisholt Machine Company
Madison 10, Wisconsin

☐ Send Saddle Type Turret Lathe Literature.
☐ Have Gisholt Representative call.

Name.....*Title*.....

Street Address.....

City.....*State*.....

Castings of

ARMASTEEL®

so tough they replace forgings so machinable...they reduce finishing costs

CLASSIFICATION	CHARACTERISTICS	HARDNESS (BHN)	MIN. TENSILE STRENGTH (PSI)	MIN. YIELD STRENGTH (PSI)	MIN. % ELONGATION IN 2 INCHES
ARMASTEEL GM 86M	Recommended for less highly stressed parts. Replaces steel parts in 1020-1035 S.A.E. range.	163-207	70,000	48,000	4.0
ARMASTEEL GM 85M	Recommended for moderate strength plus adaptability to selective hardening. Replaces parts in 1035-1050 S.A.E. range.	197-241	80,000	60,000	3.0
ARMASTEEL GM 84M	Recommended for high degree of strength. Replaces heat-treated parts in 1040-1050 S.A.E. range.	241-269	100,000	80,000	2.0
ARMASTEEL GM 88M	High resistance to wear and high yield strength, yet retains machinability. Requires no heat-treating and possesses same strength and wear characteristics as alloy steel forgings.	269-302	105,000	85,000	2.0

CENTRAL FOUNDRY DIVISION

Because ARMASTEEL castings are so machinable, so resistant to wear and shock, and so adaptable to selective hardening, they are rapidly replacing many parts formerly machined from bar stock or steel forgings.

ARMASTEEL, a pearlitic malleable iron, possesses the same strength and performance characteristics usually associated with plain carbon steel. In addition, ARMASTEEL contains excellent bearing properties, has high yield strength, good damping capacity, maximum rigidity and excellent fatigue life. Accurate control of heat-treating operations in the manufacture of ARMASTEEL produces a fine, uniform grain structure and provides excellent finishing qualities.

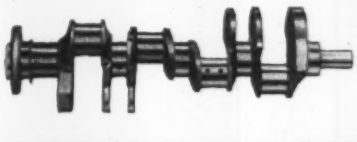
Four different types of ARMASTEEL can be cast to your specifications. One of the four (GM 84M, GM 85M, GM 86M or GM 88M) will have the physical properties to best meet the requirements of your application. For example, ARMASTEEL castings are being successfully used in the automotive, appliance and implement fields for such parts as gears, pistons, crankshafts, rocker arms and universal joint yokes, all of which utilize to best advantage the outstanding characteristics of ARMASTEEL.

Some of these applications are shown in the table. Look them over carefully; you may find that these characteristics and advantages of ARMASTEEL can help reduce your costs . . . increase your production . . . and improve the performance of your products.

Typical ARMASTEEL castings

Because of the greater physical properties of GM 86M ARMASTEEL, it was possible to redesign this anchor plate as shown and effect a weight reduction from 2.26# per piece to 1.44# per piece.

GM 86M ARMASTEEL provides the ideal casting for this automobile differential case because of its high strength, minimum deflection and good damping qualities which contribute to quietness of operation. Note the as-cast internal cavity and the well-formed webs.



GM 85M ARMASTEEL provides a crankshaft with more desirable machining characteristics than a forged crankshaft of SAE 1045 steel. Improves machining of journals and reduces cheeking stock. Use of GM 85M ARMASTEEL made possible the redesign of the crankshaft with a resulting 3.5# weight reduction and a lower material cost.

By converting to GM 85M ARMASTEEL, drilling and boring operations were eliminated on this crankshaft sprocket. Stock in rough part was reduced from 1.93# in forging to 1.00# in casting. Customer realized reduced piece price with GM 85M ARMASTEEL.

GM 84M ARMASTEEL was specified for this socket plate journal because its microstructure makes it more easily machined than steel with the same physical properties. It has better bearing and wear resistance qualities . . . less distortion during machining . . . and does not require heat treatment. Weight of part in rough is less than comparable steel forging.

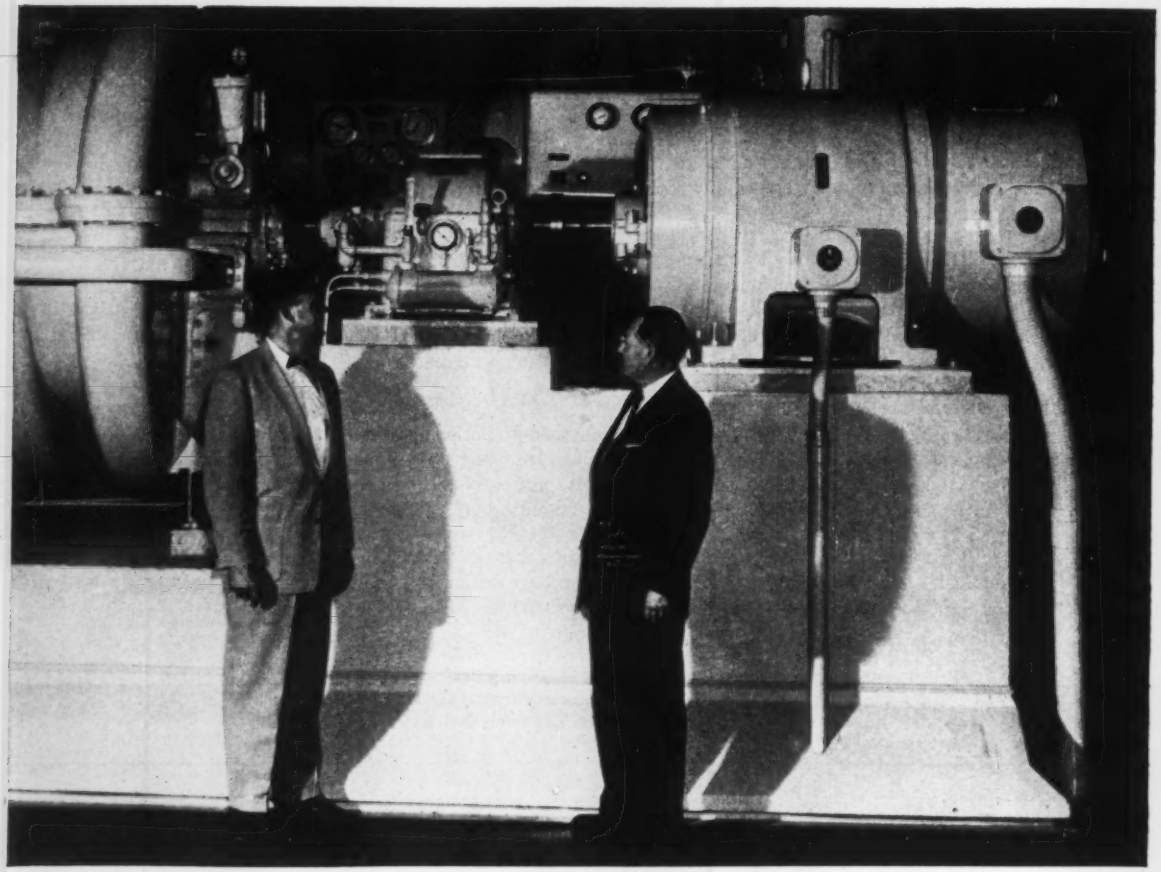
Crankshaft for newly designed small gasoline engine. GM 84M ARMASTEEL specified because of outstanding success in similar engines. Less stock removal and better machinability are advantages over forged crankshaft.

This planet gear carrier was formerly forged from SAE 1141 steel, which required a heat treatment after rough machining and broaching operations. By converting to GM 88M ARMASTEEL, heat treatment was eliminated and the weight of the rough part was reduced.

By converting to GM 88M ARMASTEEL for this universal joint yoke, hole thru hub could be cast in . . . eliminating a drilling operation and reducing weight of part approximately 30%. GM 88M ARMASTEEL part has lower piece price than forging formerly used.

85

GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN • DEPT. 20



One of two Fairbanks-Morse 4160 volt, 700 hp. slip ring motors which power Carrier refrigeration compressors.

8-speed climate with F-M motors!

Flexible control of new air conditioning system saves power and maintenance for Union Oil Center

Through a new Carrier dual-duct high-velocity system powered by Fairbanks-Morse slip ring motors, the magnificent new Union Oil Center in Los Angeles is ideally air-conditioned at minimum power and maintenance cost.

Providing 8 speeds between 75 and 100 percent of capacity, the two F-M 700 hp. motors make it possible to match operating rpm. of compressors, chillers and condensers to any specific condition. The new Center covers 5 acres, with 1200 employees occupying 426,000 square feet of the office space in a complex of four buildings—an installation requiring the finest in air-conditioning equipment and components.

Fairbanks-Morse offers the distinct advantage of a broad range of alternating and direct current motors, in all types, and in ratings from ½ to 10,000 hp.

For expert assistance in specifying, write Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Illinois.

New Union Oil Center in Los Angeles.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

ELECTRIC MOTORS · GENERATORS · PUMPS · SCALES · DIESEL, DUAL FUEL AND GAS ENGINES · LOCOMOTIVES · COMPRESSORS · MAGNETOS · HOME WATER SYSTEMS

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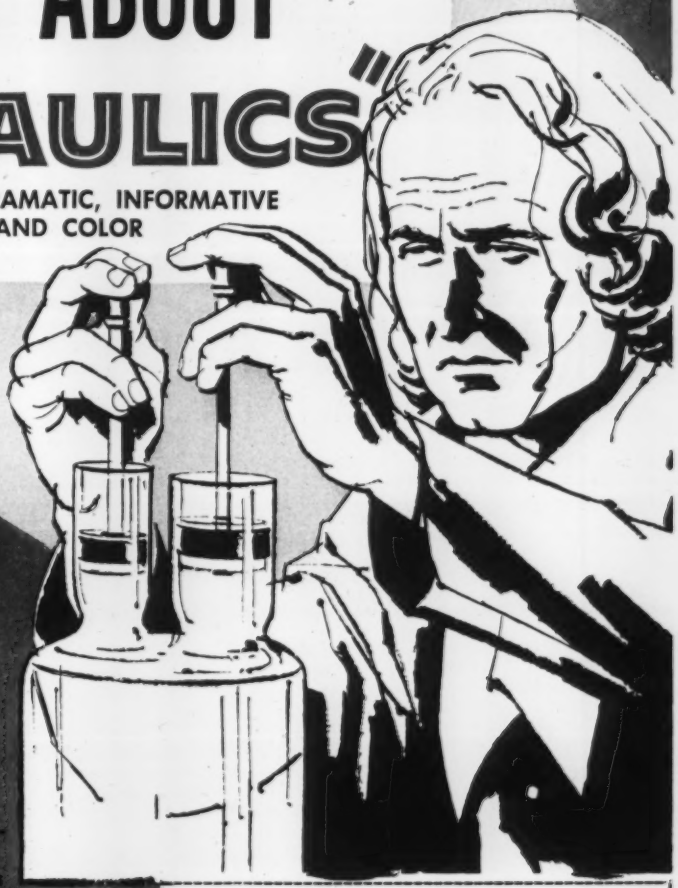
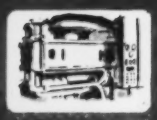
REVEALS THE TRUE FACTS ABOUT "HYDRAULICS"

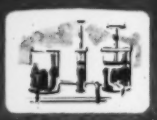
25 MINUTES OF DRAMATIC, INFORMATIVE SOUND AND COLOR





SEE the facts behind your production problems revealed

SEE your problems solved with laboratory-proved methods



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TEXACO

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

Auto Maker Switches to New Thomas Strip Pattern Rolled Steel for Instrument Panels

All four sections of instrument panel are tested for dimensions in checking fixture in Quality Standards Department of auto plant.

Rolled-in Calf-Skin design withstands deep draws, takes paint well.

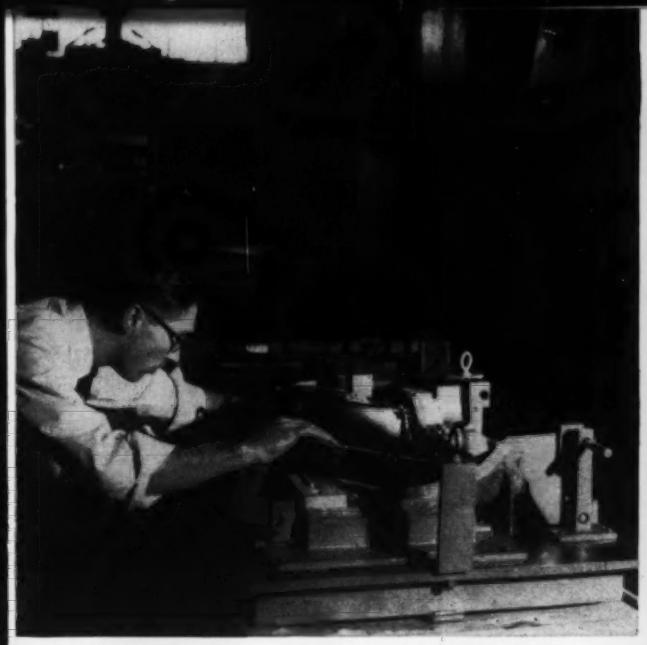
Instrument panels fabricated from Pattern Rolled Strip Steel made their debut in all 1959 models of one of the largest auto makers.

The Pattern Rolled Steel Strip is furnished the auto maker by the Thomas Strip Division of Pittsburgh Steel Co. with a leather grain. Pattern Rolled, in any design that can be drawn with pencil and paper, is available in strip and sheet widths up to 48 inches.

The auto manufacturer specifies Pattern Rolled in five widths ranging from 16 to 23½ inches in coils of steel measuring .041 inch in thickness.

• **Made In Sections**—Presses with up to 70,000 pounds pressure fabricate the instrument panels in four sections—upper right and left and two side panels. After painting and baking, panels are assembled in car bodies on the assembly lines. Testing

Close-up of the calf-skin grain rolled into the steel at Pittsburgh Steel Co.'s Thomas Strip Division.



In fabricating unit of large auto manufacturer, an instrument panel section is examined in checking fixture.

Instrument panel sections are painted and then assembled in the completed auto body.

on checking fixtures assures that both individual sections and complete panel assemblies are accurate dimensionally for a smooth fit during assembly.

Uniformity of hardness is another prime requirement for steady pressing operations. Surface is critical, too, because flaws would spoil the leather appearance and show through the painting job. Surface quality also plays a part in providing good adhesion between steel and paint.

Drawing quality must be tops. On the upper left instrument panel section, a corner is drawn to a depth of 4½ inches without tearing the steel or even pulling the design out of alignment. Here a correction of .001 inch in the depth of the original pattern yielded the best results. Now Thomas Strip provides coils pattern rolled to a very rigid specification on depth of pattern.

Pattern Rolled Thomas Strip is made from cold rolled steel with all the skill which Thomas has built up in more than 40 years of strip experience. Now Pattern Rolled is available in sheet widths with any pattern you desire rolled into the steel from one edge to the other and from the start of the coil right to the end.

Any fabricator whose product can gain sales appeal from improved appearance will profit by investigating the advantages of Thomas Strip's Pattern Rolled Strip or Sheet. It's available plain, or coated, in many widths with copper, brass, tin, chrome, nickel, zinc or lead alloy. Thomas Strip Pattern Rolled also can be coated with paint, enamel or lacquer on both sides or even on each side in a different color.

Whether you choose a design for product appearance or as an aid to further processing, Pattern Rolled's drawing quality, formability and surface will bring you production economies. Consult a Thomas Strip engineer on how you can use this new, modern metal. Call a Thomas man in the nearest district office.

Thomas Strip® Division

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pennsylvania

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Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
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Have You Had Your Degreasing Operation Checked Lately?

DETREX Has an Exact Procedure That Often Cuts Trichlorethylene Consumption 15%-25%

Solvent degreasing is a most economical method of metal cleaning. Yet, if your degreasing operation has not been carefully studied *very recently* by a competent degreasing engineer, it is entirely possible that you may be spending 25% more dollars for trichlorethylene than is necessary.

Most causes of excessive trichlorethylene consumption can be corrected quite promptly when the proper, exact procedure is followed:

1) Operational study by a qualified degreasing engineer.
2) Evaluation of his findings by a committee of chemists and engineers for determination of the necessary facts and recommendation of corrective measures.
3) Supervision of the corrections by the experienced engineer.

Our experienced degreasing engineers will be pleased to study your operation.

Depend on DETREX for Every Metal Cleaning and Processing Need

- PERM-A-CLOR NA (Trichlorethylene)
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- Ultrasonic Equipment
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- Phosphate Coating Compounds
- PAINTBOND Compounds
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Send for Dr. W. L. McCracken's Informative Paper "Solvent Degreasing, a Valuable Industrial Process"

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World's Largest Exclusive Producer of Cleaning Chemicals and Equipment

Jupiter and Redstone

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TRAC-TRED* TURNING ROLLS

*T. M. REG. U. S. PAT. OFF. PAT. NO. 2,669,364

The U. S. Army Ordnance Michigan Missile Plant, operated by the Missile Division of Chrysler Corporation had problems concerning the handling of the Redstone and Jupiter missiles with their thin-walled skin (aluminum) without damage, such as wrinkling, marring or indenting. Also how to position the missile when being X-Rayed and having certain assemblies added as well as moving the large skin from place to place.

Their solution to these problems was Aronson Rubber Trac-Treds installed on specially built dollies: two (2) Idler double Trac-Treds with rubber treds and staggered to give constant contact with the skin and so positioned as to permit 90 degrees of the skin's surface to be nestled and supported by the treds. These Idlers are placed at either ends of the dolly. The Single-Rubber Trac-Tred Driver Unit, also giving 90 degrees of surface support, is located in the middle of the dolly providing the turning power. The Trac-Tred Driver unit is 110 volt to enable the complete unit to be moved to and worked on anywhere in the large plant.

For Steady, Positive, Precision Rotation of THIN-WALLED VESSELS use ARONSON TRAC-TRED TURNING ROLLS

Quality POSITIONERS by **Aronson MACHINE COMPANY**

ARCADE, NEW YORK

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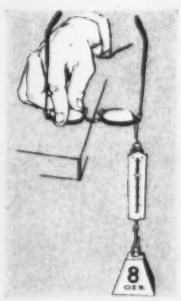
Cold upset screw products
...standards and specials.

UNQUESTIONED SAFETY PLUS EYE APPEAL THAT SPEAKS FOR ITSELF

New... *Safemaster* Safety Glasses that are Good Looking from Any Angle

Here's eye protection *any* worker can be proud to wear in either plano or Safety Rx glasses — SAFEMASTER, latest addition to the American Optical line. MORE IMPORTANT, IT IS TRULY DESIGNED AND ENGINEERED SAFETY EQUIPMENT THAT MEETS ALL EYE PROTECTION STANDARDS. Frame is made from the same high-quality nickel silver as our popular F5100 line.

The trim is durable nonflammable plastic — workers will appreciate the freedom from glare reflection. Every frame must pass the edge transverse test, the flat transverse test and the solder joint test of the National Bureau of Standards. The catalog number of SAFEMASTER is F5200. Protect your workers with SAFEMASTER, another quality AO Ultrascopic Safety Spectacle that *looks good while guarding against eye accidents*. Your nearest AO Safety Products Representative can supply you.



QUICK FACTS

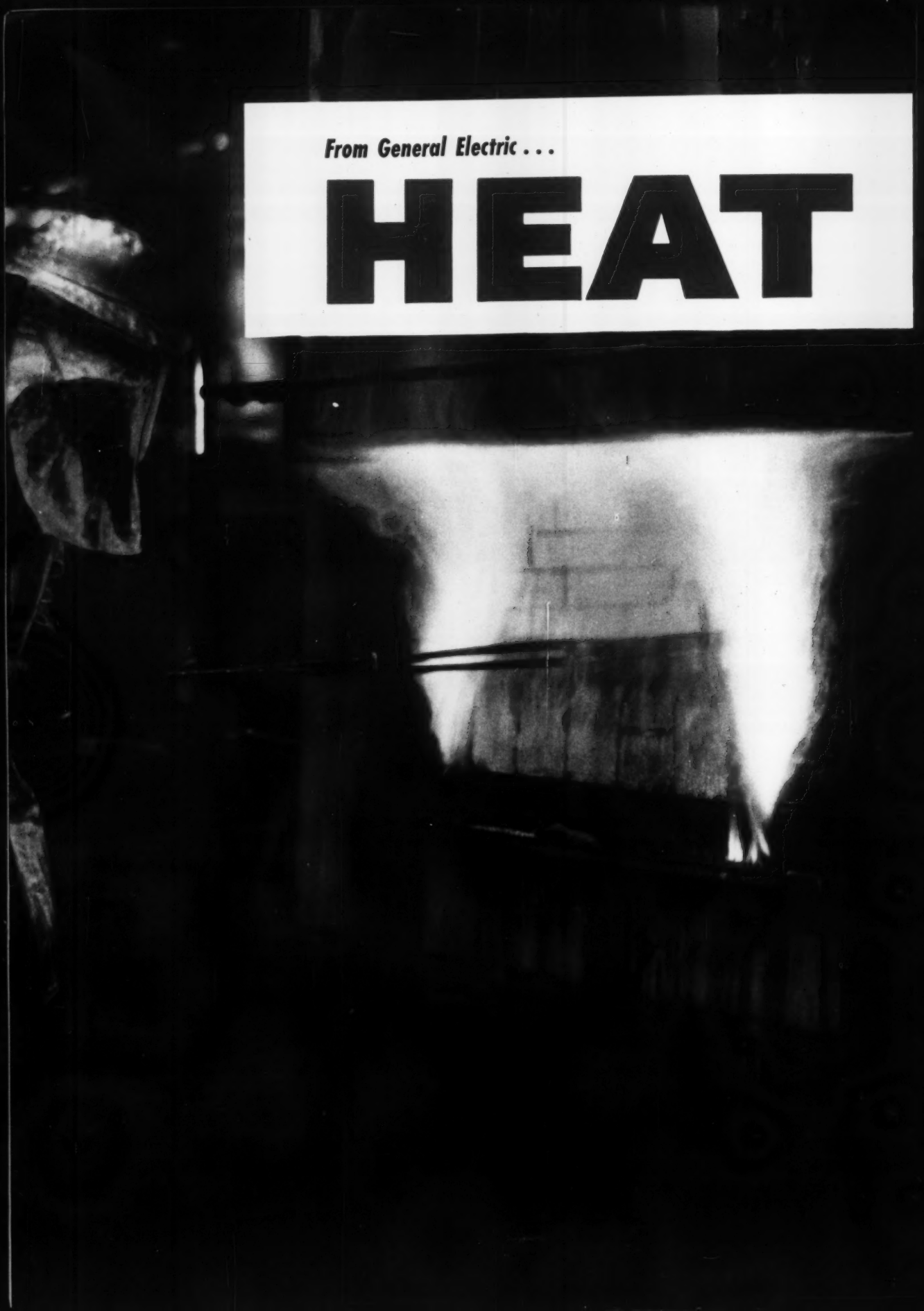
- 4 Eye sizes — 5 Bridge sizes
- Comfort cable and spatula tip temples
- Engraved eyewire — adds a distinctive touch
- Non-snagging screw heads on endpieces
- Acetate non-corrosive nose pads. Adjust by universal pivot. Easy to replace
- Strong, double-braced bridge has 4 contact points — 4 solder points securely attached to frame (An AO exclusive)
- AO 6 curve Super Armorplate clear or medium, dark or extra dark Calobar lenses, interchangeable right and left

NOTE: Because of SAFEMASTER's handsome appearance, many workers who need protection as well as correction are certain to say: "That's for me!" And why not? Remember, Super Armorplate lenses may be ground to the worker's prescription.

Always insist on AO Trademarked Lenses and Frames

American Optical COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
Safety Service Centers in Principal Cities


From General Electric . . .
HEAT

G.E. DESIGNS NEW FURNACE FOR HIGH-TEMPERATURE VACUUM OPERATIONS

Versatile new radiation shield furnace breaks heat barriers of conventional furnaces for critical super-alloy heating jobs

These new General Electric radiation shield furnaces give you faster heating and cooling cycles than you can obtain with your present hot retort furnaces. But in addition, they offer unmatched versatility for your future heating needs which hot retort furnaces can't possibly handle.

G-E radiation shield furnaces have been designed to operate from 1900 F to 2600 F, and in smaller sizes up to 4200 F. They can be used with vacuum, or with inert or hydrogen atmospheres. They are readily adaptable for the heat treatment, brazing and sintering of super-alloy stainless steel, and metals like titanium and zirconium.

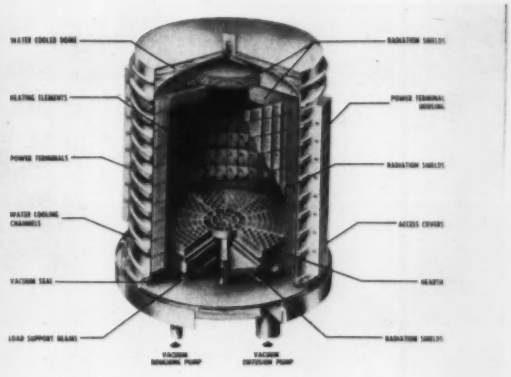
In addition to the versatility of higher temperatures and atmospheres, there's no metal retort between the heating units and the work in a radiation shield furnace. You get fast heating. And rapid cooling rates are provided by G.E.'s new cooling system that allows rapid recirculation of the cooling medium. Because of the more rapid heating and cooling cycles, a single radiation shield furnace can often do the work of a hot retort furnace with two bases and retorts . . . and give you substantial savings in floor space.

If you heat treat super alloys, seriously consider the advantages of a new G-E radiation shield furnace. You'll find General Electric engineers have the knowledge and design skill to match a furnace to your needs. Call your G-E Heating Specialist. Contact your nearby General Electric Apparatus Sales Office, or write Section 721-24, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

TYPICAL APPLICATIONS	Stress Relief	Annealing	Brazing	Sintering	Solution Heat Treatment	Degassing
Stainless Steels	X	X	X	X	X	X
Super Alloys	X	X	X	X	X	X
Tungsten	X	X	X	X	X	X
Tantalum	X	X	X	X	X	X
Molybdenum	X	X	X	X	X	X
Columbium (niobium)	X	X	X	X	X	X
Titanium	X	X	X	X	X	X
Vanadium	X	X	X	X	X	X
Zirconium	X	X	X	X	X	X
Hafnium	X	X	X	X	X	X

***High-temperature heat treating equipment** of all types, ranging from the box furnace at left to the radiation shield furnace at right, are available from General Electric.*



***The new radiation shield furnace** is another example of General Electric pioneering in the field of high-temperature heat treating. This furnace is rated from 1900 to 2600 F, in smaller sizes up to 4200 F.*

Symbols of Service

to all metal-working industries

The Morse "house emblem" and the NIDA seal are *double warranty* of the best you can get in quality and service.

For Morse-Franchised Distributors are like the tools they sell . . . tested and proven on their jobs . . . men of experience and responsibility who know how to get you top value for every dollar you spend on cutting tools.

So call him in today . . . *your* Morse-Franchised Distributor. You'll find him more and more of a business asset, the longer you do business with him.

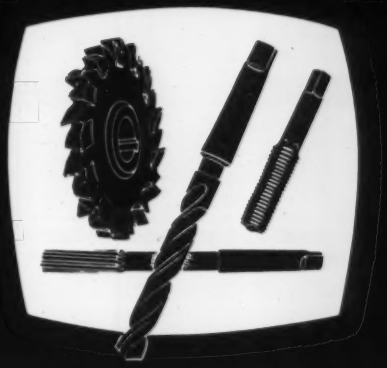
MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASSACHUSETTS

WAREHOUSES IN NEW YORK, CHICAGO, DETROIT, DALLAS, SAN FRANCISCO

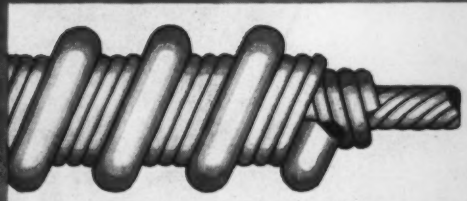
A Division of VAN NORMAN INDUSTRIES, INC.

Morse

CUTTING TOOLS



How NS solved another special wire problem



REMOTE CONTROL cable for jet aircraft is made of layers of high-tensile National-Standard wire wound around a stranded core. Heavy outer wire provides helix or worm-gear surface for meshing with hobbed wheels.

Photo courtesy Pan American Airlines

Special National-Standard wire helps fly new jet-liners

When the age of commercial jet transportation in the U.S. began last January, giant jet-liners inaugurated flights across the country at speeds over 600 mph. To control these new aircraft swiftly and easily requires control cables of the utmost reliability, efficiency and endurance.

NEW COMMERCIAL JET-LINERS, as well as many military aircraft, are flying now with a unique remote control cable system made of special high-tensile wire wound around a stranded core with a heavy outer wire of stainless steel wound to a pitch of 10 per inch. This outer wire acts as a helix to engage hobbed wheels within the various system control boxes.

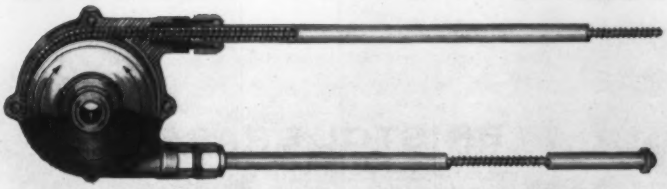
NATIONAL-STANDARD ENGINEERS worked closely with a control-cable system manufacturer to develop wire of just the proper alloy and rugged physical properties required to withstand extreme temperature and flight stress variations. National-Standard submitted wire samples to microstructural studies and physical tests to assist the customer in determining the conditions that would allow bending cable around pulleys without giving a permanent set to the cable. In addition, alloy steels with various coatings were tested to improve wear and galling resistance for various applications. The result was the development of a special stainless-steel wire that exceeded rigid specifications.

EXPERIENCED ENGINEERING HELP, of this kind, for jobs requiring high-quality wire to meet special or unique applications, is available to *you* from National-Standard. For any of the many thousands of applications where only special wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

Manufacturer of specialty wire and metal products

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS**, Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY**, Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL**, Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE**, Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS**, Carbondale, Pa.; decorative, commercial, and industrial perforated metals.



FLEXIBLE CABLE engages accurately with specially hobbed wheels housed in control boxes. This combination requires special cable wire that will not take permanent set and will provide smooth, hard bearing surface for cable inside conduit.

NATIONAL-STANDARD engineers made intense microstructural and tensile studies of sample wire to find exact physical properties of the alloy to meet strict aircraft control specifications.

You're right "on the beam" when you land on BRISTOL BRASS STRIP

If you use Brass strip, Bristol will furnish the exact temper and grain-size best suited to the fabrication of your product.

Uniformity of gauge . . . combined with consistent adherence to close width-tolerances . . . will please the most exacting operator.

You will save on buffing, polishing and overall fabricating costs . . . and you'll gain greater consumer acceptance.

Let us tell you the whole story on "Bristol Fashion" metallurgical controls and technical service.

The **BRISTOL BRASS**
CORPORATION

Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT.

New design permits tooling up of one bolster *(right)* while press is producing parts from die on other bolster. This press, at the A. O. Smith Corp. plant, in Milwaukee, Wis., is expected to achieve 94% utilization.

Press downtime . . . down from hours to minutes

THE NEW HAMILTON SLIDING BOLSTER PRESS:

- **Reduces parts inventory**
- **Meets changing schedules on time**
- **Cuts number of presses required where die changing is frequent**
- **Eliminates long and costly die setting operations**
- **Provides storage area within press frame**
- **Available in all types and tonnages**

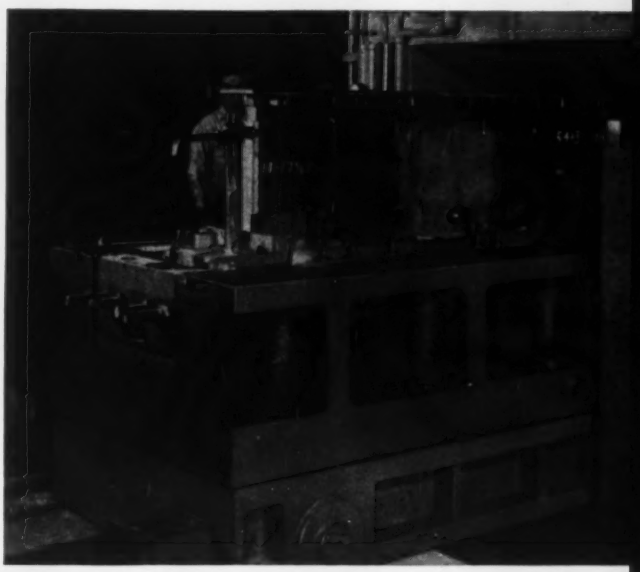
No longer need hours — and sometimes days — be wasted in unproductive press downtime while changing dies for another run. This major step in stamping and forming press room operations is made possible with the Hamilton Sliding Bolster press.

A 1250-ton 2-point, top-drive press equipped with two sliding bolsters recently installed at a Midwest automobile parts plant is proving the economies of the innovation—on parts up to 12 ft. long.

While the press produces parts from a die mounted on its operating bolster, a second bolster can be tooled for the next run. Changeover time is negligible —pushbutton-controlled hydraulic motors quickly and positively position the second bolster for speedy startup and production of the next part.

In the open position, the bolster is clear of the press frame for easy die change and setup. Crane handling of heavy dies is absolutely unobstructed.

For further information, write Dept. 1-D



Pushbutton-operated bolsters slide into place in minutes. Downtime for changing dies is virtually eliminated.

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools & general machinery

THIS WAY . . . for FASTEST

WELD GRINDING

SIMONDS ABRASIVE CO.

DOUBLE XX

Reinforced Resinoid

Depressed Center Wheels

Fastest by far . . . of the three types of depressed center wheels that Simonds makes! Double XX is made like a conventional grinding wheel with *maximum* amount of abrasive grain — doubly reinforced for extra strength and safety. Lightweight, rigid type, for general use, especially grinding welds.

Simonds also makes Fibrex Wheels, slightly flexible, for the lighter jobs and stainless steel. Also Simex Red Wheels, extra strong for heavy duty use. Send for catalog ESA-244 describing all three.

CALL YOUR SIMONDS DISTRIBUTOR

Proven products

Dependable know-how

Quick supply

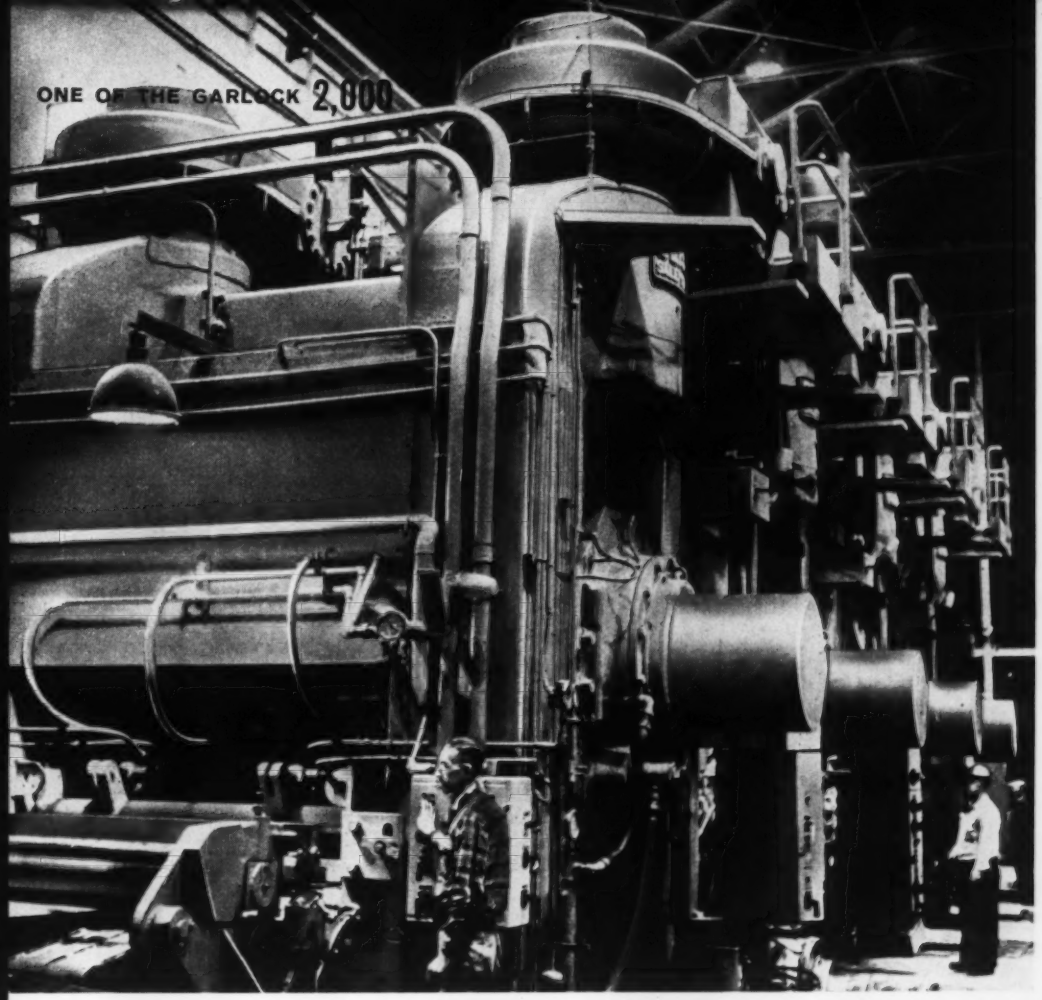
SIMONDS ABRASIVE COMPANY

Tacony & Fraley Sts., • Philadelphia 37, Pa.

Division of Simonds Saw and Steel Co.

BRANCHES: CHICAGO • DETROIT • LOS ANGELES • PHILADELPHIA • PORTLAND, ORE. • SAN FRANCISCO • SHREVEPORT

SIMONDS CANADA SAW CO., LTD., GRINDING WHEELS DIVISION, BROCKVILLE, ONTARIO



Model 64 assembled KLOZURE for back-up and work rolls. Designed for large shafts, severe service.

Model 82 bonded KLOZURE for back-up and work rolls, normal to high speeds. Comes as large as 44" diameter.

Model 21 or 23 Split-KLOZURE for installation without disassembly of equipment. Medium-speed service.

Model 142 face type KLOZURE for mill rolls. Designed to seal surfaces perpendicular to shaft.

Model 53 assembled KLOZURE for table rolls, normal to high speeds. Withstands temperatures to 250° F.

On all mills—Bearings are fully protected by Garlock KLOZURE* Oil Seals

Everywhere in steel—on hot and cold strip mills, blooming and structural mills, rolling mills—Garlock KLOZURE Oil Seals prevent leakage of vital bearing lubrication. And, they further prevent damage to the bearings by sealing out dirt, spray, and other foreign matter.

Model 142, for example, keeps water splash and scale out of bearings at the shoulder of a mill roll. Models 64 and 82 are ideal for protecting bearings on back-up and work rolls; Model 53 is recommended for table rolls; and, where equipment can't be dismantled easily, Model 21 or 23 split-KLOZURES are the choice.

All KLOZURES are oil and grease resistant . . . impervious to water, mild acids, alkalies . . . non-abrasive . . . withstand temperatures from −40° F. to +250° F. For extreme conditions, Garlock furnishes sealing elements resistant to practically any fluid, and serviceable as high as +500° F.

KLOZURE Oil Seals are another part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. Call your local Garlock representative, or write for Catalog 20.

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

**Registered Trade Mark*

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

Canadian Division: The Garlock Packing Co. of Canada Ltd.

Plastics Division: United States Gasket Company

MACHINE TOOLS can be TAUGHT

. . . to produce closer tolerances, Faster and Automatically . . .

. . . by use of *MICROtrol* gaging and control elements, selected combinations of these *MICROtrol* 160 elements permit you to control production automatically. They will inspect each piece, sort out the rejects, and tell the operator and/or machine tool *when* and *how much* correction is needed. Simple and flexible, 54 *MICROtrol* elements can automate all of your production immediately . . . or by stages.

MICROtrol electronic inspection and controls make needed corrections before rejects pile up . . . without stopping the machine tool to check work. *MICROtrol* takes pressure off the operator . . . allows him to produce more . . . with greater accuracy.

Centerless grinding tolerances up to .000025 are possible by adding an INCHWORM motor to the *MICROtrol* 160 system. When used in a closed loop system, *MICROtrol* elements automatically gage work, feed back correcting information to the INCHWORM, compensate for wheel wear . . . instantaneously.

SEE IT WORK IN YOUR PLANT . . .

at Our Expense!

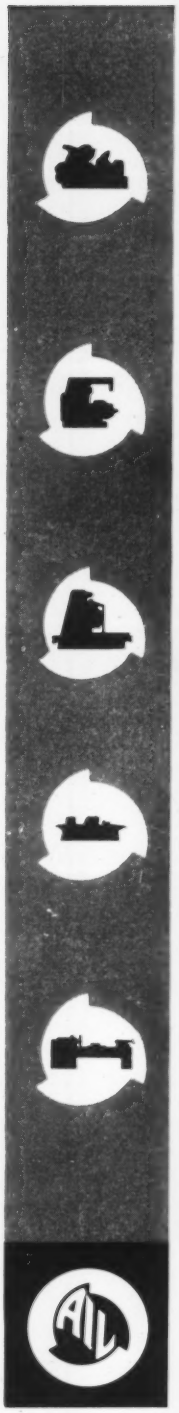
The INCHWORM can be installed on your centerless grinder in less than an hour—and proves itself immediately. We will install it in your plant, *on approval*, upon the recommendation of our sales engineer.

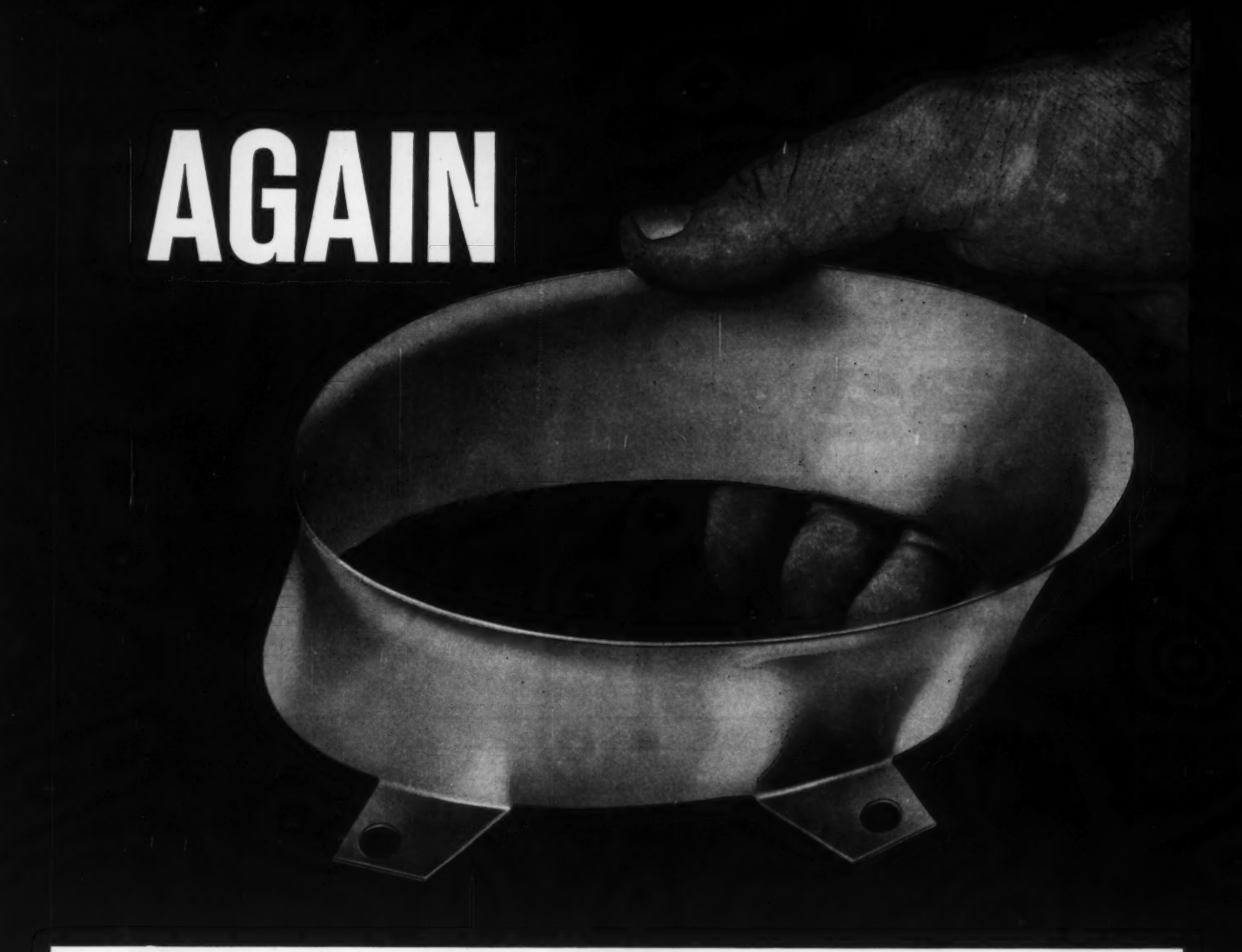
Contact your nearest Cutler-Hammer office or write AIL for full details, and descriptive literature.

AIRBORNE INSTRUMENTS LABORATORY

1345 NEW YORK AVENUE, HUNTINGTON STATION, L. I., NEW YORK

A DIVISION OF CUTLER-HAMMER, INC.





Revere helps "fit the metal to the job"

AND A MAKER OF FINE CARS SAVES MONEY WHILE IMPROVING PRODUCT QUALITY

Recently, a manufacturer of top-flight motor cars was having trouble in producing the above escutcheon for the front bumper lamps used on his newest model.

First of all, the breakage of the part was excessively high. Second, the escutcheon which is drawn at an angle, and contains a concave surface on the inside presented a problem in that, after buffing, polishing, and flash plating, the finish produced did not exactly match the chrome-plated bumper.

Revere's Technical Advisory Service suggested these difficulties might be overcome by using Revere 70-30 Brass Strip.

Here, again, by "fitting the metal to the job" Revere's Technical Advisory Service was able to reduce manufacturing costs while improving the quality of the product. Finish of parts was improved while finishing costs were reduced. Finished parts proved an excellent match. Switching to the more ductile metal resulted in less tool wear, while breakage was reduced to less than 1%. All this with little adjustment of existing press equipment.

Why not consult with Revere's Technical Advisory Service and take advantage of its extensive knowledge in "fitting the metal to the job." This Service has saved others money, why not you?

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

Mills: Rome, N.Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N.Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities. Distributors Everywhere.

The Research-Cottrell score on electrical precipitators for 1958:

32 installations put into operation and completely performance-tested

32 installations meet or exceed guarantees

Unprecedented is this record number of 32 installations in one year — all of which met or exceeded their performance guarantees. The chart below shows a number of these installations.

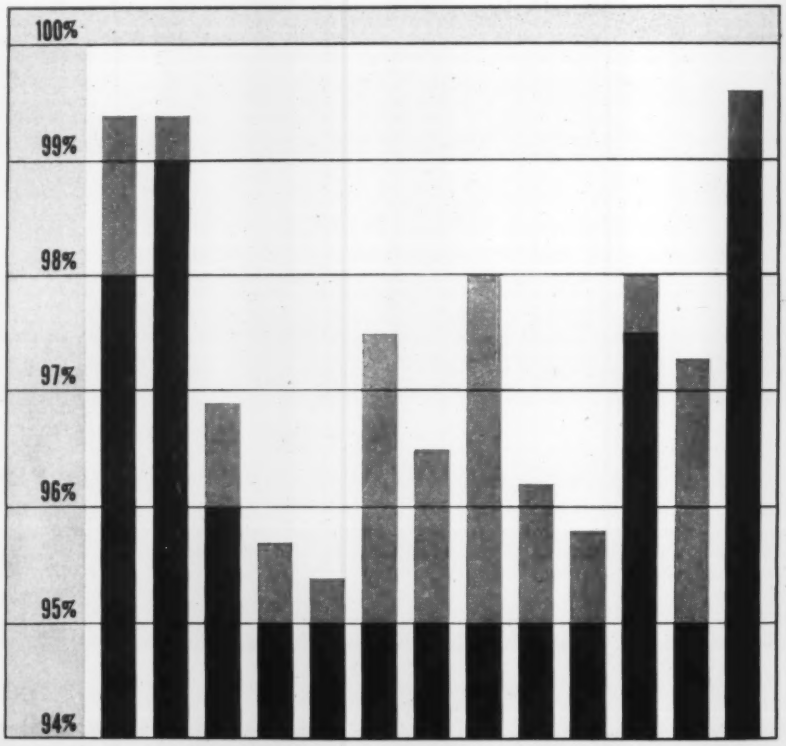
Such a record is no accident. It is largely the result of 1198 years of combined engineering skill and experience — factors which have made Research-Cottrell the undisputed leader in electrical precipitation.

On your next job — if you want the assurance of trouble-free installation and operation, be sure to call on Research-Cottrell.

RC 196

Chart shows 13 typical installations which have exceeded guarantees.

(NAMES ON REQUEST)



Performance over and above your guarantee is a big extra. For example, in the chart, the first bar shows an actual loss of only ¼ of the guaranteed maximum loss. This means a far cleaner gas at no extra cost to you.

Research-Cottrell, Inc.

RESEARCH-COTTRELL, INC. Main Office and Plant: Bound Brook, N. J. • 405 Lexington Ave., New York 17, N. Y.
Grant Building, Pittsburgh 19, Pa. • 228 N. La Salle St., Chicago 1, Ill. • 58 Sutter Street, San Francisco 4, Cal.
Research-Cottrell (Canada) Ltd., 33 Bloor Street East, Toronto 5, Ontario

FLEXIBILITY + CUT-ABILITY = LONGER LIFE AND LOWER COSTS...

with SIMONDS

HARD EDGE **Metal Cutting Band Saw**

Here's a tough, edge-holding band saw blade that gives a real bonus in smooth, fast cutting and long life. Made of rugged, wear-resistant alloy steel, Simonds "Bonus" Band Saws have sharp, perfectly formed teeth that are set with absolute evenness on both sides of the blade. Hardened along the tooth edge only by scientifically controlled heat treatment, they combine maximum cut-ability with flexibility and resistance to breakage . . . have an enviable reputation for dependable, trouble-free service. All standard widths, tooth styles and spacings are available from stock in coils or welded-to-length for all makes and types of band saw machines.

A "RIGHT" BLADE For Every Need

•

REGULAR TOOTH
SABRE TOOTH
SKIP TOOTH

•

REGULAR or WAVY SET

•

HARD EDGE
HIGH SPEED STEEL
SPRING TEMPER

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio
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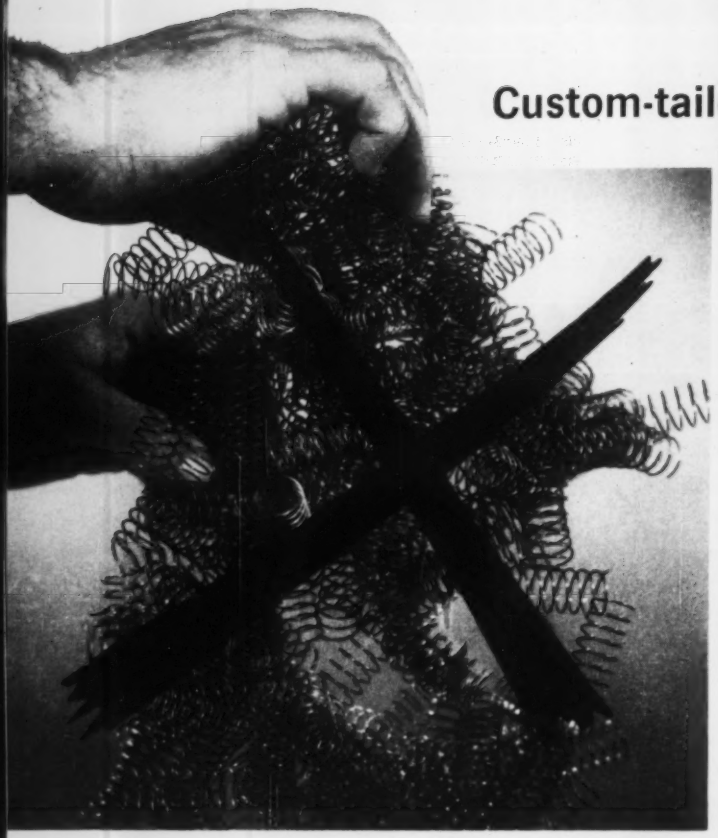
For Fast Service from Complete Stocks
Call your
SIMONDS Industrial Supply DISTRIBUTOR

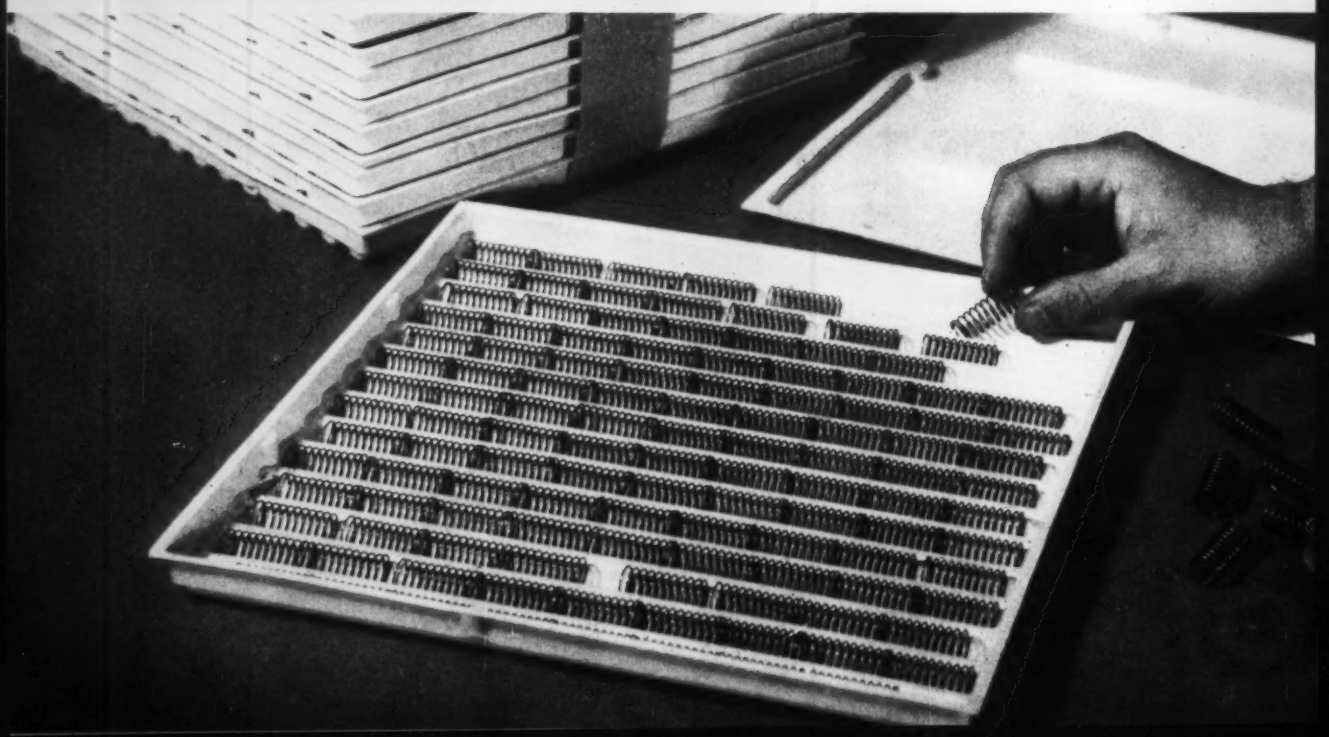
INDUSTRIAL DISTRIBUTORS — THE RIGHT HAND OF PRODUCTION

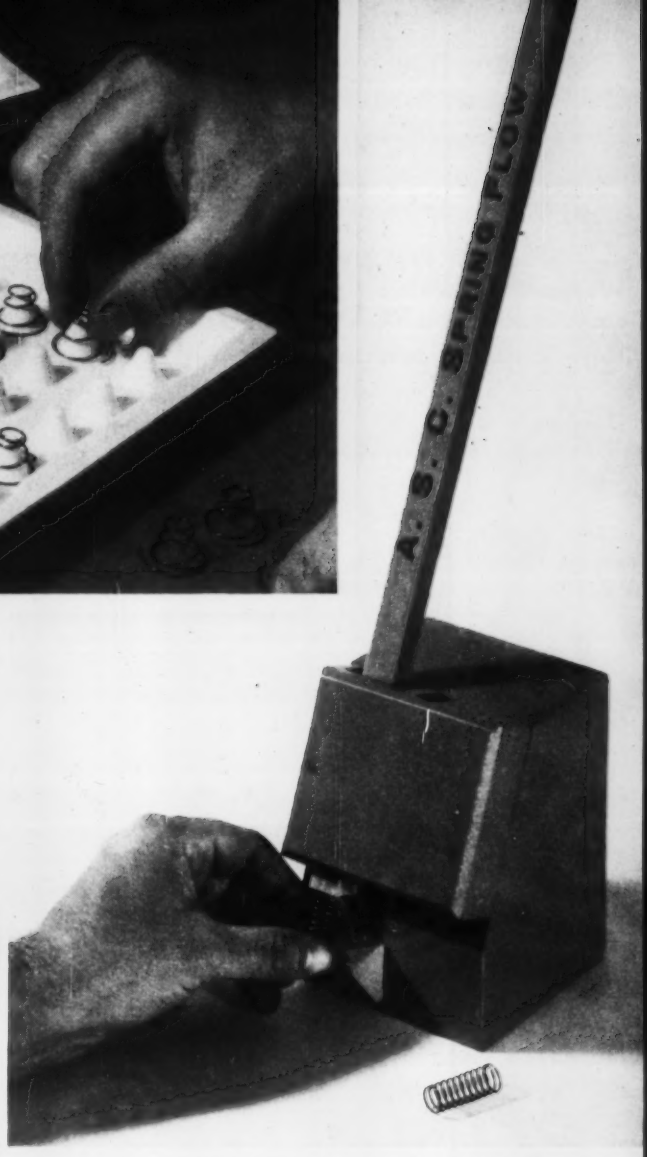
NEW... Spring Flow®



Custom-tailored packaging of springs that cuts costs and speeds operations in your plant

Spring Flow is a systematic approach to the problems of handling and storage of springs, wire forms, small stampings, in customer plants. It overcomes time-wasting tangling, and the distortion that often results from tangling. It can be engineered for specific applications to expedite hand or automatic assembly.





Spring Flow lowers handling and assembly costs — eliminates distortion — protects finish

Spring Flow makes use of a variety of modern materials, dispensers, containers. The extent to which it may be applied depends on the complexity of each individual part and handling requirements. The cost of Spring Flow is frequently offset by resulting savings.

The potential benefits of Spring Flow almost defy imagination. Ask for a Spring Flow proposal for your springs or other fabricated-metal products. Or find out more about this exclusive service by writing for the new booklet—"Spring Flow."

Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.
B-G-R Division, Plymouth and Ann Arbor, Mich.
Gibson Division, Chicago 14, Ill.
Milwaukee Division, Milwaukee, Wis.
Raymond Manufacturing Division, Corry, Penna.
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Dunbar Brothers Division, Bristol, Conn.
Wallace Barnes Steel Division, Bristol, Conn.

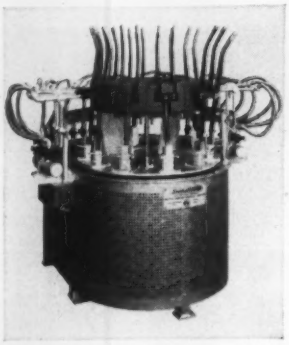
Canadian Subsidiary: Wallace Barnes Co., Ltd., Hamilton, Ont. and Montreal, Que. Puerto Rican Subsidiary: Associated Spring of Puerto Rico, Inc., Carolina, P.R

5303

Columbia produces 250 bicycle forks per hour with automatic GAS brazing

Gas brazing is not new to Westfield, where Columbia bicycle frames have been brazed with Gas-fired Selas processing equipment for many years. During this time, pre-placing of brass filler material and automatic heating have limited dependence on operator skill, reduced material waste, and eliminated costly cleanup operations. With the installation of the new Gas brazing machine in their production operation, these advantages have been extended to include fork manufacture, also.

For information on how Gas equipment can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and outstanding results you'll get with Gas and modern Gas equipment. *American Gas Association.*



Two fork styles in all standard bicycle sizes are joined from eight steel components on this new automatic Selas machine by Westfield Manufacturing Co., Westfield, Mass. Controlled combustion and flame geometry bring the parts to brazing temperature of 1750°F in only 86 seconds, using economical Gas equipment.

This man knows how to use the "Touch of Gold"

He is bringing a product closer to its finished state, adding the "Touch of Gold" by using exactly the correct Norton reinforced wheel to do the best job. To help you bring this value-adding benefit to your product there are many types of Norton reinforced wheels, using different types of reinforcement . . . glass cloth, nylon, cotton and combinations of them. There are resinoid and rubber bonds . . . straight and depressed-center shapes for every grinding, cutting off or slotting job where you need reinforced wheels. And every wheel is a product of Norton research.

Your Norton Man can bring these "Touch of Gold" benefits to your production. He is a qualified abrasive engineer with broad, practical experience that is backed by Norton's complete line of abrasive products and world-wide resources and services. He can save you production time and money. Call your Norton Man. NORTON COMPANY, General Offices, Worcester 6, Massachusetts.

NORTON
ABRASIVES

Making better products...to make your products better

SPS RELIABILITY / *A dynamic standard of predictable performance*

Need large precision parts?

300-lb. precision stud, meeting rigid mechanical and metallurgical specifications, exemplifies capabilities of SPS Nuclear Products Division. SPS is a major supplier of high-reliability structural components for nuclear reactors and related equipment, as well as for other types of power-producing machinery.

SPS Nuclear Products Division can meet your most exacting requirements

The SPS Nuclear Products Division offers unique facilities for handling your large-diameter precision machine work. This includes not only outsize bolts and studs, but also such items as control rod housings, coolant pump components, and large bushings—in conventional metals and in various super alloys.

Among the division's special-purpose machinery are batteries of modern tracer lathes and milling machines, some capable of swinging sections 3 ft. in diameter and 11 ft. long. There is also unusual equipment for deep hole drilling and internal grooving, including models able to produce precision holes up to 80 in. deep. Available too are SPS' extensive heat treat and plating facilities, as well as the services of the company's Navy-certified welders.

To meet the need for extreme reliability in its field, the Nuclear Products Division maintains a separate quality control staff to provide 100% inspection of its products. It also manufactures its own special gaging (unavailable commercially) to check out unusually large or complex parts. In addition, the division has access to the SPS fastener testing laboratory—largest of its kind in the U.S. —and the SPS Metrology Laboratories, recently set up to study fit problems of precision mating parts.

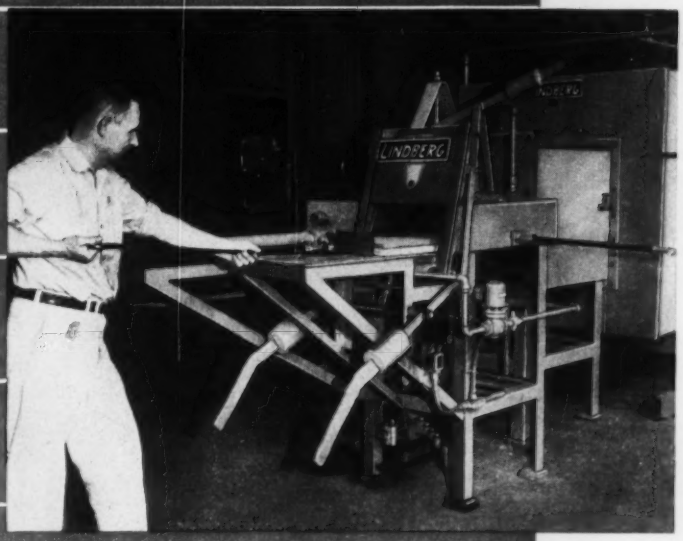
New Folder 2499 gives further information on this specialized service of SPS—manufacturer of precision threaded industrial fasteners and allied products in many metals, including titanium. For copies, write Nuclear Products Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

SPS **Jenkintown • Pennsylvania**

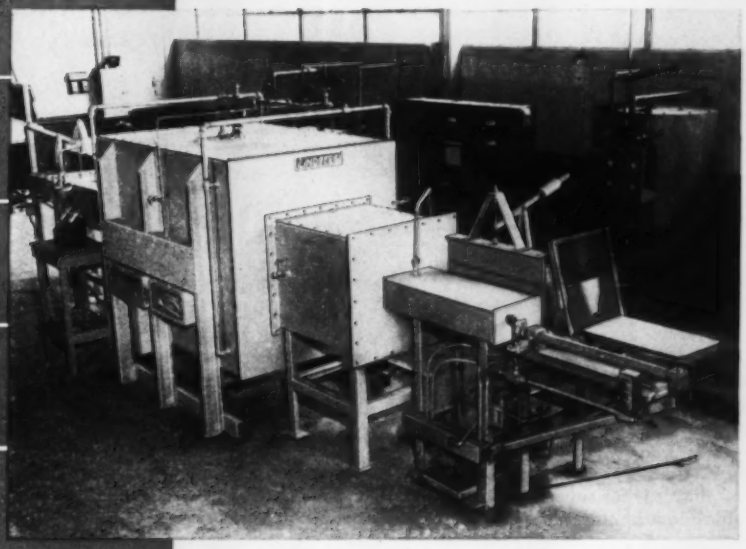
Standard Pressed Steel Co. • The Cleveland Cap Screw Co. • Columbia Steel Equipment Co. • National Machine Products Co. • Nutt-Shel Co. • SPS Western • Standco Canada Ltd. • Unbrako Socket Screw Co., Ltd.

If your production needs call for Sintering call on Lindberg for just the right Furnace

As it does in all types of industrial heating equipment; Lindberg provides a complete line of sintering and brazing furnaces. Here is one of our latest:



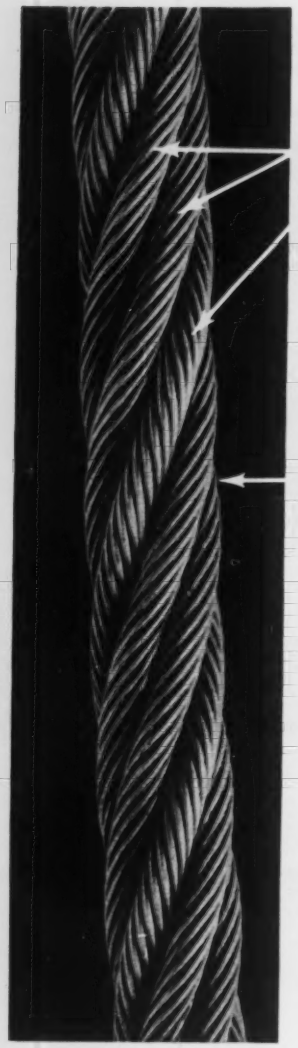
A new Lindberg development, this Molybdenum Element Atmosphere Pusher Furnace is designed with high temperature refractories suitable for low dew point without need for a muffle. It is now being used for sintering stainless steel compacts in hydrogen or dissociated ammonia. Ammonia dissociator and control panels are shown at the right of the furnace below. In this installation hydrogen supply cylinders are located outside the building. Furnace provides side loading and discharge ports with purging chambers. Work trays, ceramic slabs or molybdenum boats, move through the furnace by hydraulic pusher. If you have a sintering or brazing problem why not talk it over with Lindberg. Just get in touch with your nearest Lindberg Field Representative or write us direct. Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois.



Type MOP-12307-A80C Molybdenum Element Atmosphere Pusher Furnace. Maximum Temperature 3000°F. 60 KW input. 12' wide, 30' long, 7' high. 80' cooling chamber, 24' long preheat chamber.

LOOK UP LINDBERG, BOOTH 3, at METAL POWDER SHOW in PHILADELPHIA

LINDBERG heat for industry



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristics.

Heavier outside wires in each strand have greater resistance to abrasion.

"...and it has a much longer life"

GASKILL CONSTRUCTION COMPANY

The above quote is one of the things that Gaskill Construction Company says about the new Roebling Herringbone* Wire Rope. There are further quotes: ". . . We, after giving your Herringbone cable a great deal of use, find that it is far superior to any other cable and it is much more economical."

These are *user* statements about the newest design development in wire rope in many years. Herringbone is the regular lay and Lang lay wire rope. It is two-ropes-in-one rope, with the best features of each in combination. It has been used, with the same success quoted here, on a wide variety of machines as well as on tough hoisting jobs. Its potential is virtually unlimited wherever all-steel ropes are specified and on most installations where fiber core ropes are standard.

Your Roebling Distributor has full details on Herringbone, or contact Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

*Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

GENERAL REFRACTORIES

GREFCO INTERNALLY PLATED BASIC BRICK HELPS BREAK STEEL PRODUCTION RECORDS

● General Refractories developments—starting with the RITEX process—have steadily kept pace with the advance of American steelmaking. As new methods of furnace construction placed continuously greater demands on refractories, Grefco produced, in turn, progressively tougher, more durable, more serviceable refractory brick. Grefco's RITEX pioneered the field of chemically bonded basic brick; STEELKLAD was the first brick with integral metal encasement; FERROCLIP and TAB brick answered the need for brick positioned by mechanical means.

To meet demands for ever-higher operating temperatures to speed steel production, Grefco introduced the revolutionary EE *internally-plated* basic brick. Permitting a phenomenal growth in the number of "All-Basic" open hearth furnaces, and capable of withstanding the far more punishing heating-and-cooling cycles of modern, heavy-oxygen steel production, *The GREFCO "EE" HAS MADE POSSIBLE A DEVELOPMENT BREAKTHROUGH IN STEELMAKING.* Most significantly, the world's open hearth steel production record, exceeding 100 tons per hour, was recently established by a Grefco-equipped "All-Basic" furnace.

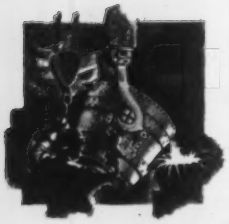
Through constant research and development of new and improved products, Grefco maintains its traditional leadership in the field of basic open hearth refractories.

• • •

Grefco technical and sales service personnel are ready to help you build simplified basic furnaces, whether of sprung, suspended, or combination roof construction. Please contact them, without obligation.

GENERAL REFRACTORIES COMPANY, Philadelphia 2, Pa.

A Complete Refractories Service



AMERICAN ORIGINALS IN IRON AND STEEL

The dry creek that stopped the furnace

In 1792, America's infant iron industry had spread as far west as Kentucky. In that year, a furnace was erected by Jacob Meyers on Slate Creek in Bath County.

The undertaking was a slow and laborious one. Essential supplies had to be packed through the wilderness. Timbers and stone were hewn and set by hand. Flash floods were a constant threat, and Indian raids an ever-present menace.

Finally, after a year of patient toil, the operation was completed. The great mill wheel churned, the bellows pumped and the furnace roared . . . but not for long. As the southern sun beat down, Slate Creek fell from a turbulent stream to a timid trickle. The mill wheel stopped, and so did production . . . until welcome rains once more filled up the dry flood gates.

Modern-day producers, of course, aren't exposed to such production hazards. But, there are others which you can eliminate by using Baker's MAGDOLITE. This carefully developed product will assure you of uniform ingots and lowest refractory costs. This is because MAGDOLITE has proved itself 5 ways better . . . in composition, preparation, strength, economy, and quality. Don't just say dolomite, specify Baker's MAGDOLITE . . . and be SURE!

ANOTHER AMERICAN ORIGINAL

JEBCO
PRODUCTS
SINCE 1889

BAKER'S MAGDOLITE
The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO

High-and mighty-stacker!

Lift, move and stack your king-size loads with a massive Gerlinger lift truck that takes weather, grades and rough terrain in its stride! Transporting 5 . . . 10 . . . 20 ton payloads in one man operations means *king-size savings* as well.

You'll get all the instant power, roadability and load stability you need, in *Gerlinger* lift trucks—literally "made to measure" for your specific handling operations. Ask for Towmotor-Gerlinger Certified Job Studies—and new Specification Folder GSS. Write Towmotor Corporation, Cleveland 10, Ohio or Gerlinger Carrier Co., Dallas, Oregon.

COME SEE US AT . . .
1959 MATERIAL HANDLING INSTITUTE'S EXPOSITION
CLEVELAND AUDITORIUM — JUNE 9-12 1959
BOOTHS 1302-1307-1404

TOWMOTOR® THE ONE-MAN-GANG — **-GERLINGER*** LEADERS FOR 40 YEARS IN BUILDING FORK LIFT TRUCKS, CARRIERS AND TRACTORS

*Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

integrated CRUCIBLE steel service

Crucible inside account salesmen (1) simplify ordering and expedite deliveries of the steels you need, (2) arrange for handling extra services, (3) supply you with basic steel and metalworking data.

staffs 31 local warehouses with specialized personnel to solve your specialty steel problems

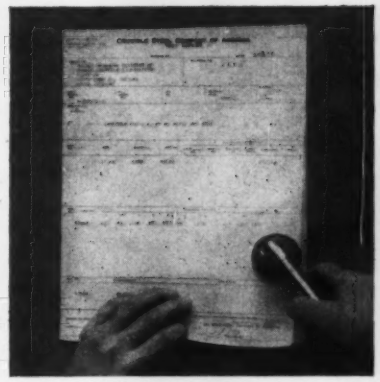
"We frequently rely on Crucible warehouse people," says one of our good customers. "We've found they can sometimes show us more economical steels, sizes and methods than those we're using. Furthermore, they give us valuable help with steels we're using for the first time."

This steel buyer, like thousands of others, believes in getting services with the steels he buys. Here's what he gets:

Crucible inside account salesmen help him simplify ordering, speed up his deliveries. They can efficiently arrange for extra services, such as forging, slitting, grinding and polishing, because of their special training at Crucible mills.

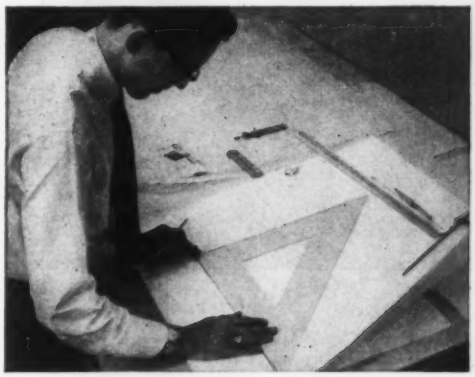
Crucible sales-service engineers give their production and toolroom people valuable metalworking assistance. They'll recommend machining speeds and feeds, quenching temperatures, the best forming and joining methods.

Behind these specialists are the resources of Crucible's entire, integrated operation – from mining the ore to steelmaking to warehouse delivery to you. Why not take advantage of these services each time you order specialty steels? They're available through every Crucible warehouse. *Crucible Steel Company of America, Dept. PD15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



Need certified test reports for government work? Warehouses can supply the steels and notarized reports of analyses.

Trained, experienced sales-service engineers can help your engineers use steels that are new to you.



This is the easiest way to arrange for forging, flame-cutting — have the warehouse accommodations service do it for you.

STOCK LIST
Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS–Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel
ALLOY STEELS – Bars, billets, strip and sheet
COLD ROLLED CARBON SPRING STEELS
DRILL STEELS – Hollow and solid drill steels
ALUMINUM EXTRUSION DIE STEELS
HOLLOW TOOL STEEL
WELDING AND HARD FACING ROD
PLASTIC MOLD STEELS
PERMANENT MAGNETS
– and many others

CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis St. Paul • Syracuse • Tampa • Toledo • Tulsa • Toronto, Ont.

48 buffing machines ...and no dust!

Buffing brass parts can be a dirty business . . . but it's just the opposite at Grand Rapids Brass in Grand Rapids, Michigan. Here, one AAF Type N ROTO-CLONE snatches up dust the instant it is produced at 48 buffing machines. This one AAF unit is handling 32,000 cfm of air filled with metallic dust and sticky adhesive lint particles.

The high cleaning efficiency of this hydrostatic precipitator results from the combined action of centrifugal force and the thorough intermixing of water and dust-laden air. There's no secondary dust problem—no fire hazard either. The wet-collecting Type N turns dust into a harmless sludge.

In addition to buffing—whether manual or automatic—the Type N ROTO-CLONE has many other industrial applications. Call your local AAF representative, or write direct for Type N ROTO-CLONE Bulletin 277. Address: Mr. Robert Moore, American Air Filter Company, Inc., 443 Central Ave., Louisville, Ky.

AAF **American Air Filter**
BETTER AIR IS OUR BUSINESS

OUR experienced engineers are available to make practical suggestions on the efficient operation and maintenance of your equipment.

Our simple daily cost record determines the most efficient type of abrasives for you to use, and equally important, proves the kind of economies Cleveland Metal Abrasive can offer.

Many customers are already using the Cleveland cost system. Write us today for more information, together with new catalog No. 159, or call our nearest representative.

CLEVELAND is the name and the place for PERSUASIVE ABRASIVES

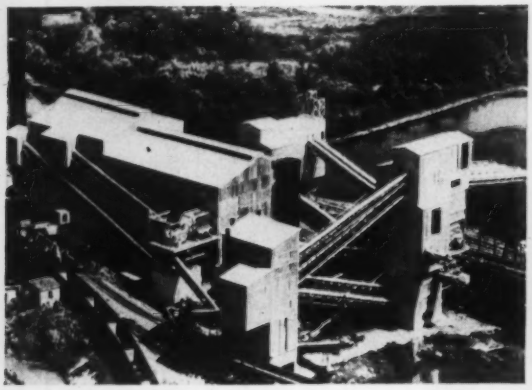
1. Realsteel Shot and Grit	2. Pearlitic Malleable	3. Normalized
4. "A" Iron	5. Hi-Strength "B"	6. Chilled Iron
		7. Cut Wire

the CLEVELAND metal abrasive company

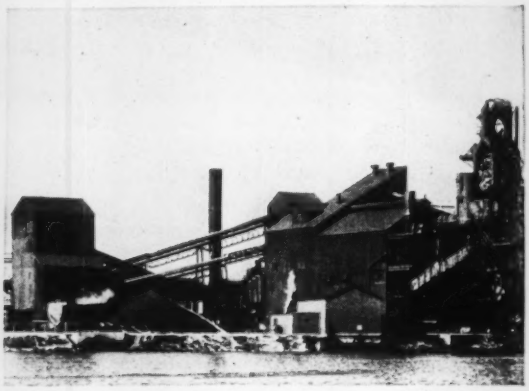
GENERAL OFFICE: 888 East 67th Street • Cleveland 3, Ohio • PLANTS AT Howell, Michigan; Toledo; Cleveland

World's Largest Production Capacity

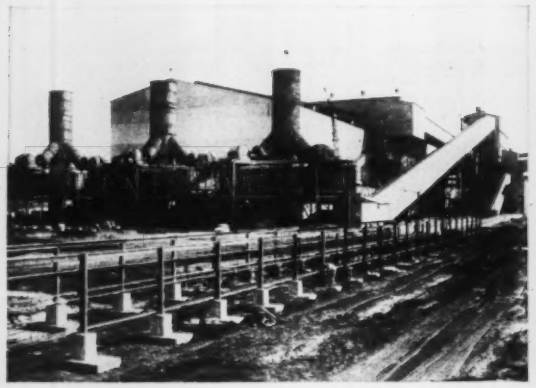
First these:



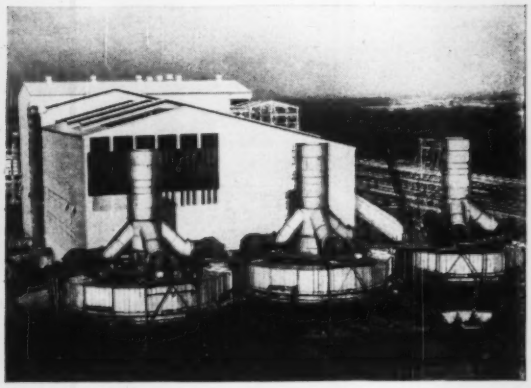
ARMCO



McLOUTH



GARY



SAXONBURG

and now:

THE WORLD'S LARGEST SINTER MACHINE

Sinter machine width: 13′ 2″

Sinter machine length: 184′

Sinter machine area: 2419 sq. ft.

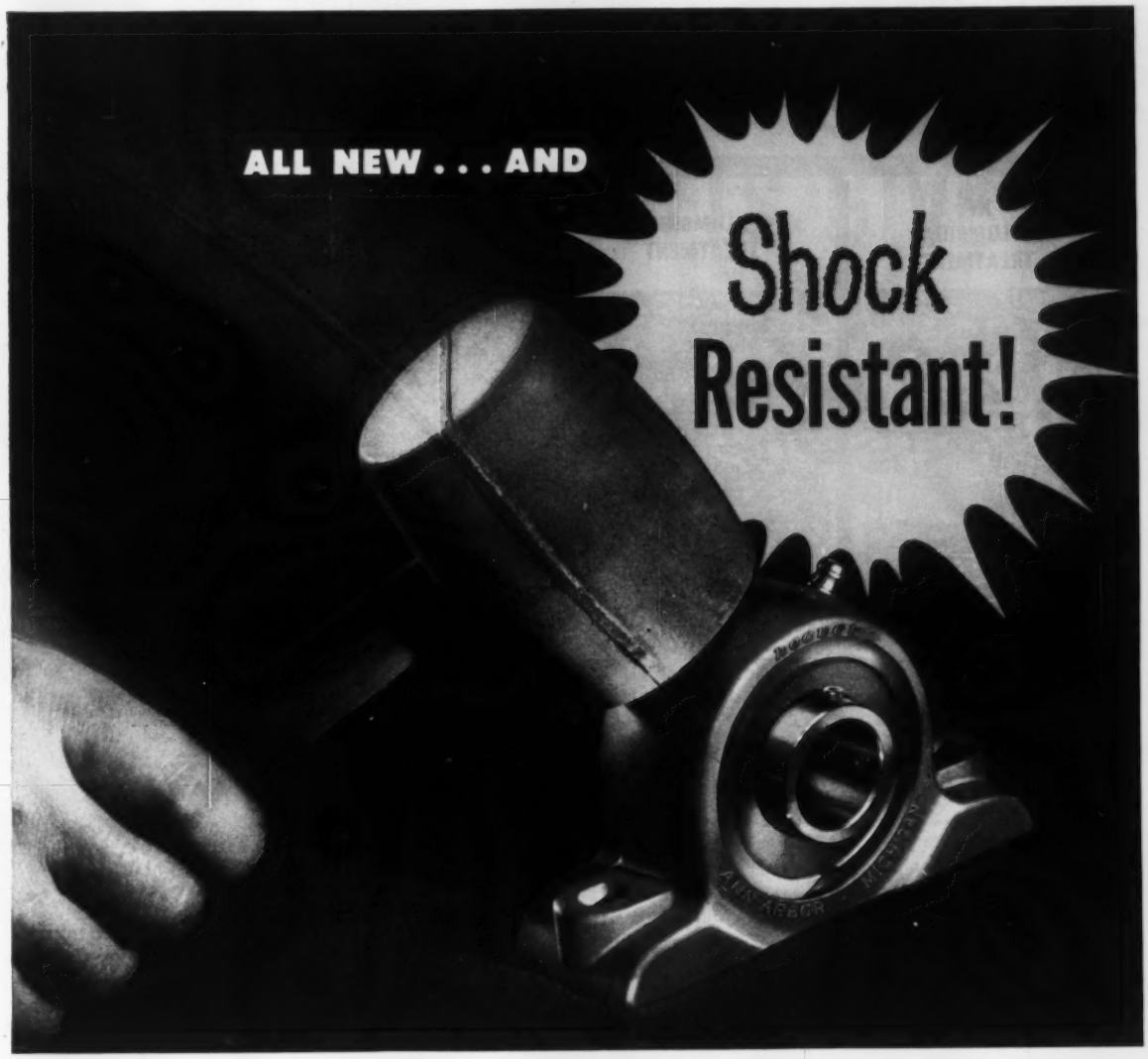
Engineering constructor—Dravo Corporation

For: Jones & Laughlin Steel Corporation, at Aliquippa, Pennsylvania

DRAVO

CORPORATION

PITTSBURGH 22, PA.



Hoover pillow blocks with ductile cast housings

Hoover introduces a new, economical pillow block ball bearing unit with cast housing of ductile material that absorbs shock and vibration, assuring long bearing life. It is designed to carry light loads at normal speeds.

The unit contains a pre-lubricated bearing featuring ultra-smooth *Hoover Honed* raceways and a perfectly matched set of *Micro-Velvet* balls, a guarantee of unexcelled quality. Known as the E D series, these new pillow block bearings are available in shaft sizes from ½" to 1 3/16".

Hoover also offers a cast iron pillow block bearing for light to medium load conditions, plus a wide range of flange and machine units.

NEW BULLETIN 106 DESCRIBES COMPLETE LINE OF NEW HOOVER PILLOW BLOCK BALL BEARINGS!

Please return coupon for your copy

S-4

Hoover Ball and Bearing Company
5400 South State Road, Ann Arbor, Michigan

Please send new Bulletin 106, which describes Hoover pillow block ball bearings.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State____

hoover

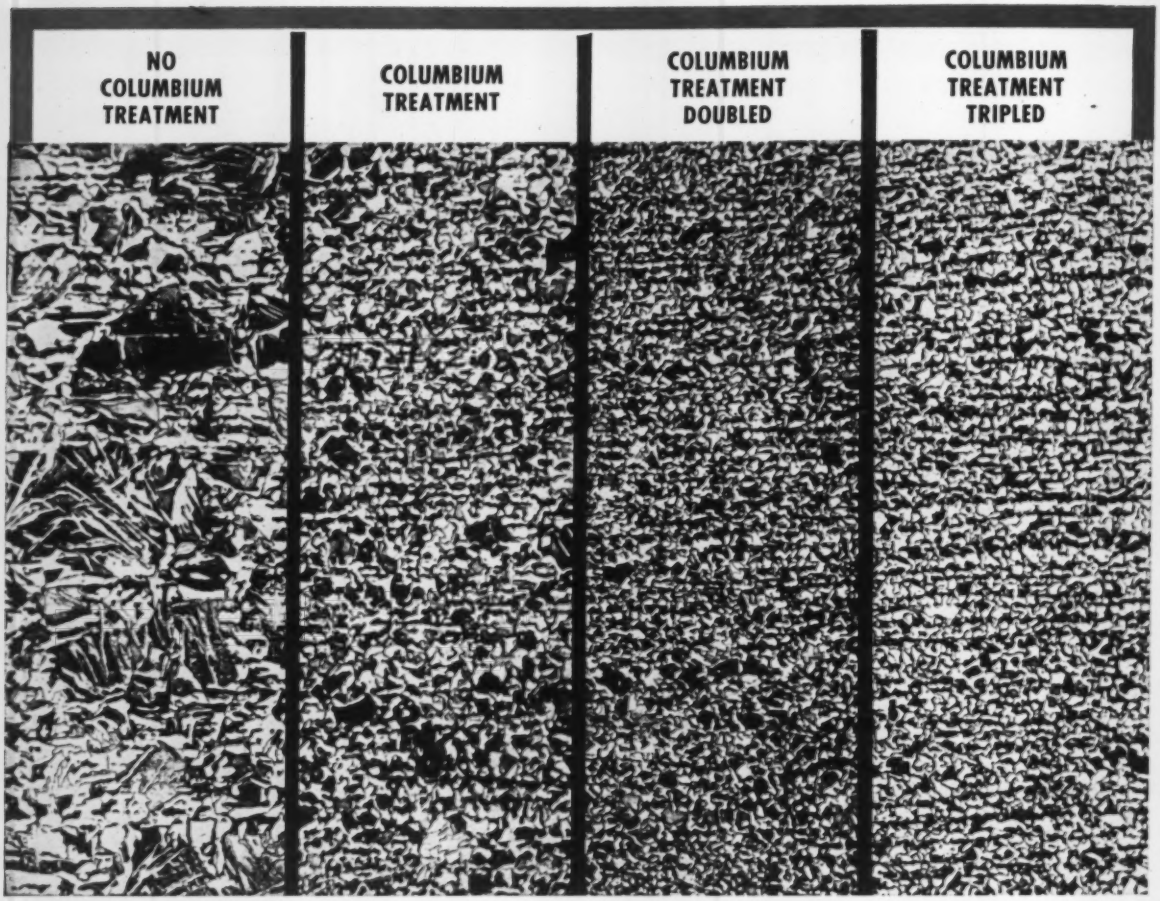
BALL AND BEARING COMPANY

5400 South State Road, Ann Arbor, Michigan

Sales Offices and Warehouses: 2020 South Figueroa, Los Angeles 7, California | 290 Lodi Street, Hackensack, New Jersey

Hoover Honed and *Micro-Velvet* are Hoover trademarks.

HOW GREAT LAKES



Composite of photomicrographs made from the same heat of mild carbon steel shows the effect of varying columbium treatments on the grain structure of the steel.

The Great Lakes Family of High-Strength Steels

N·A·X FINEGRAIN STEEL

Lets you design superior performance, longer life and less weight into your product. Many diversified applications.

N·A·X HIGH-TENSILE STEEL

Offers all the characteristic features of N-A-X Finegrain, plus greatly enhanced resistance to atmospheric corrosion.

GLX W

A series of fine grained, mild carbon steels. They have unusually high strength, toughness and weldability.

N·A·X N-A-XTRA STEELS

Quenched and tempered steels of excellent weldability and toughness, with yield strengths from 80,000 - 110,000 psi.

N·A·X HIGH MANGANESE STEELS

N-A-X High Manganese and High Manganese Special Killed. These steels give yield strengths up to 50,000 psi.

STEEL CORPORATION'S NEW GLX-W STEELS GIVE ... HIGH STRENGTH TOUGHNESS REDUCED COSTS

Key to the success of Great Lakes' new GLX-W Series of steels is the fine grained internal structure produced by treatment with columbium. This grain refinement also contributes to ductility. And in addition, the GLX-W Series' low carbon and manganese content assures excellent weldability with freedom from underbead cracking under all conditions.

COST AND WEIGHT SAVINGS

Where design permits the replacement of carbon steel with GLX-W steels, weight savings of 20 to 35 per cent, and cost savings of 10 to 25 per cent can be realized. When replacing alloy steels the cost savings can range from 25 to 35 per cent. These steels feature higher yield strengths, greater tensile strengths and increased toughness without costly heat treatments or extensive alloy additions.

The GLX-W Series is so priced that substantial cost reductions can be obtained by weight reduction over mild carbon steel. Cost reduction can also be obtained over alloy steels because of the lower price of GLX-W steels.

STRONGER AND TOUGHER

GLX-W steels are stronger and tougher than ordinary mild carbon steels and in some applications can do the job now being done by the more costly alloy steels.

MANY USES FOR GLX-W STEELS

GLX-W steels are especially recommended for a broad range of applications in mobile equipment and pressure vessels, as well as the transportation and construction fields.

GLX
W

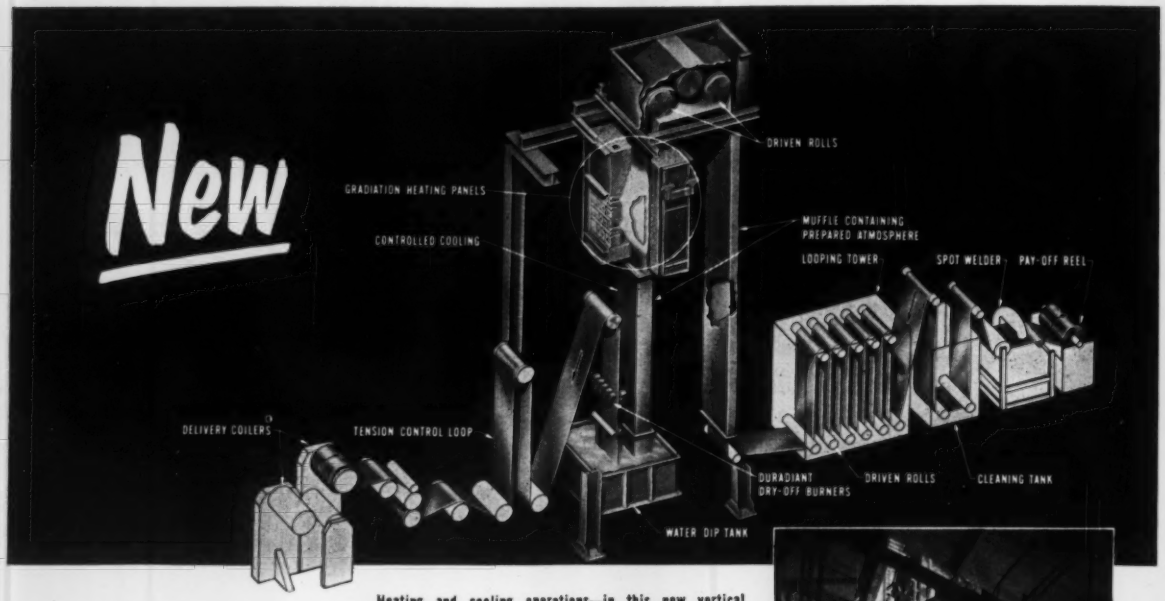
For additional technical information about these economical GLX-W steels write

Product Development Division, Dept. B-1

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION



Heating and cooling operations—in this new vertical muffle, continuous annealing line—occupy only 10 ft linear floor space. Simple threading device, built into muffle system, permits rethreading in minutes . . . without loss of atmosphere . . . in event of tear-off of strip.

Continuous Annealing Method Improves Quality of Stainless Steel Strip

. . . achieves uniform temper, uncontaminated surface

Selas Gradiation®—used extensively as a direct-firing technique in ferrous and nonferrous strip processing—brings the same features of fast, uniform heating to operations requiring controlled atmospheres.

Stainless steel strip . . . up to 25 in. wide, as thin as 0.001 in. . . . is annealed at Somers Brass Company, Waterbury, Conn., with this new Selas vertical, muffle-type furnace.

Users of this strip report improved die and tool life experienced in deep-drawing operations . . . attributed to:

- Uniformity of annealing
- Improved surface, completely devoid of surface oxide or other imperfection.

The new vertical furnace provides Somers Brass with several processing advantages over conventional horizontal muffle annealing:

- Less muffle material
- Longer muffle life
- More uniform strip temperature
- Improved atmosphere purging

Selas Gradiation heating can prove beneficial to you, too. At your convenience . . . without cost or obligation to you . . . a Selas field engineer would welcome the opportunity to survey your needs.

For this personal service—or descriptive literature on Selas strip heating (please identify operation)—address Dept. 24, Selas Corporation of America, Dresher, Pa.

Gradiation is a registered trade name of Selas Corporation of America.

SELAS
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers
DEVELOPMENT • DESIGN • CONSTRUCTION

Bridgeport Ultra Fine Grain Brass Increases the Beauty and Value of Samsonite Luggage

The striking good looks and incomparable durability of Samsonite luggage make it the most popular "traveling companion" in America. Part of Samsonite's beauty and strength comes from Bridgeport Ultra Fine Grain Brass strip; formed by stamping into the clasps, locks and handle sockets of Samsonite's "Streamlite" selection.

Ultra Fine Grain is exceedingly smooth after bending, forming or drawing and it can be quickly and economically buffed to a high luster at little cost in time and effort. Often, buffing alone is sufficient to meet end-use requirements.

In addition, you are offered specialized technical and engineering aid on any product or production problem that may confront you. Call your nearest Bridgeport Sales Office for immediate service.

Complete and fully descriptive information on Bridgeport Fine Grain Brass can be had in the brochure, "Grain Size, the 4th Dimension of Brass." A request to Dept. 3905 will bring you your copy.

SOLID BRASS HARDWARE
Strong, long lasting Bridgeport Ultra Fine Grain Strip forms these catches for Samsonite Luggage—keeps their natural beauty for the life of the luggage.

Bridgeport Brass Co.

BRIDGEPORT BRASS COMPANY

Bridgeport 2, Conn. • Sales Offices in Principal Cities

Specialists in Metals from **A***luminum to* **Z***irconium*

use Airco's new Dip Transfer† *CO_2 Process***

for **ALL-POSITION WELDING OF STEEL IN ALL THICKNESSES**

low costs • easy fit up • high speed • very low spatter • no warpage

In welding mild sheet steel manually, there's only *one way to reduce costs and produce high quality welds* at the same time. Airco Dip Transfer CO_2 Process Welding. Let's be specific: –

- The complete Airco Dip Transfer CO_2 package welds in all positions . . . manually!
- Welds are hydrogen-free.
- Virtually ends warpage – only low average currents are used for burn off.
- Creates little or no spatter.
- Handles typical steel joint fit ups.
- No flux needed.
- Penetrates deeply – critical for high quality.
- Welds much faster than flux-based processes.
- Uses money-saving Pureco CO_2 as shielding gas.
- The basic equipment welds all weldable metals.

The Airco Dip Transfer CO_2 Process gives you consistently *high quality* welds at *lower costs* than any other process. For complete information, phone or write your nearest Air Reduction Representative. Ask for the new 24-page "AIRCOMATIC CO_2 WELDING" Catalog.

Visit our booth 521—April 7-8-9 at the Welding Show—International Amphitheatre, Chicago, Ill.

Pureco CO_2 is supplied by the Pure Carbonic Company, a division of Air Reduction Company, Incorporated.

†Trademark

**Patent Applied For

AIRCO®

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated

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Offices and authorized dealers in most principal cities

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Cuban Air Products Corporation

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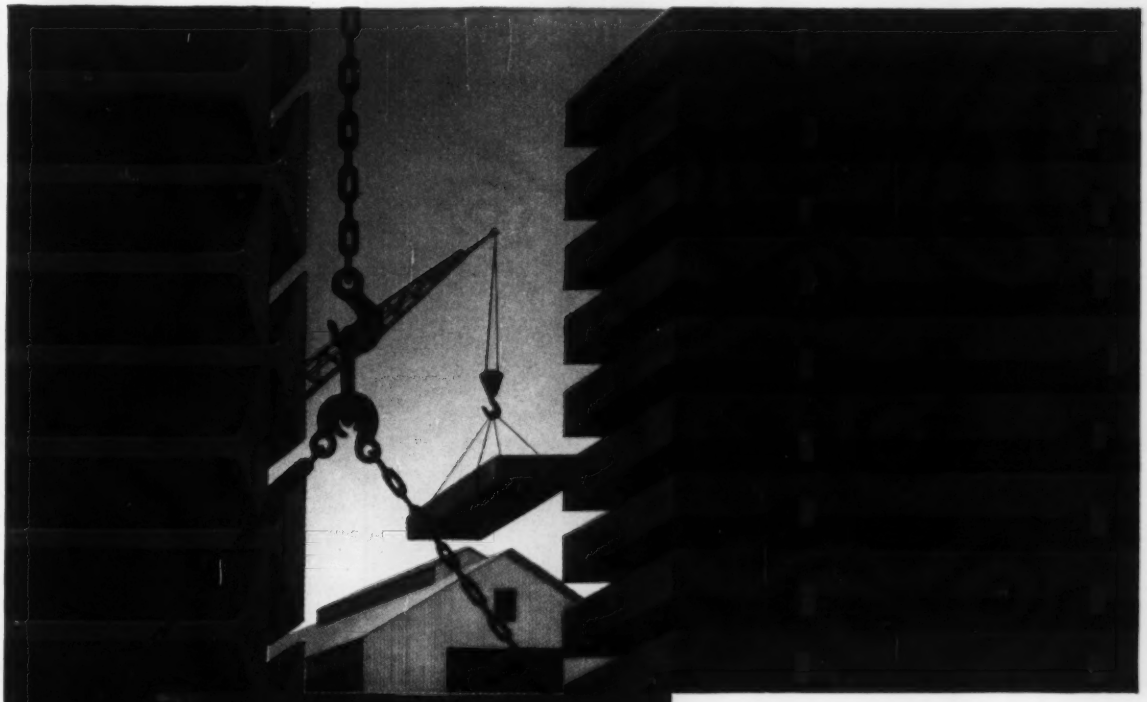


Plan Your Steel Insurance Now

With steel supply tightening up again and the possibility of a real scarcity in the months to come, it's nice to have your orders for plain and fabricated steel in the hands of a reliable and well-supplied organization.

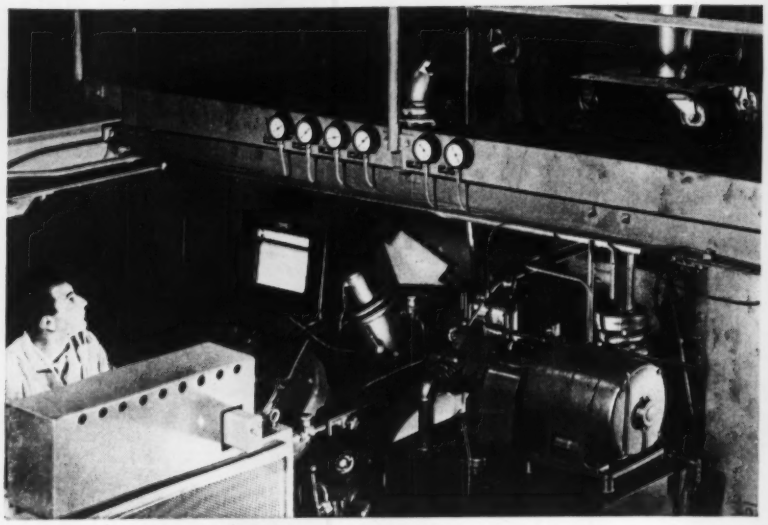
Steel buyers everywhere know Levinson's reputation for having steel on hand . . . and for "fabrication that fits."

just . . . Leave it to **LEVINSON**

Warehousers, fabricators, designers of steel for over half a century

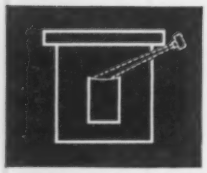
the **LEVINSON STEEL COMPANY**

Pittsburgh 3, Pa.
Phone: HUbbard 1-3200



CONTINUOUS MELT RECORD AT 3000°F with the *Radiamatic* unit (arrow) attached to a Stokes semi-continuous vacuum furnace at Allegheny Ludlum Steel Corporation, Watervliet (N.Y.) Works. Honeywell engineers worked with Allegheny-Ludlum to provide a constant record of vacuum furnace temperature—without calibrating rheostats or other complicated adjustments.

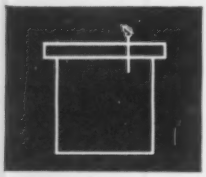
Honeywell has the tools to solve your high temperature measurement problems



RADIAMATIC RADIATION DETECTORS

For measuring temperatures to 7000°F.

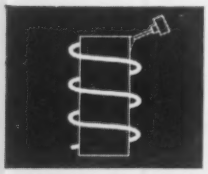
Measure "problem" temperatures with *Radiamatic* detectors. Use them to measure the temperature of moving objects without physical contact . . . or for representative temperatures over large areas. Available in many models including a small-target unit with ¼" aperture for temperatures up to 7000°F.



THERMOCOUPLES

For sensing temperatures in the area of 4000°F.

New experimental Honeywell thermocouple materials like Rhenium-Molybdenum and Rhenium-Tungsten measure temperatures as high as 4000°F. Great diversity of elements and accessories permits you to select the thermocouple which fits your application exactly.



SAPPHIRE RODS

For measuring temperatures to 3600°F.

Sapphire rods, used as lenses in *Radiamatic* pyrometers, provide accurate high-temperature measurement where such measurement previously could not be made by conventional means . . . can "sight" on a target as small as ⅛".

Precise measurement of high temperatures is almost an art. Working effectively with temperatures over 2800°F. calls for an intimate knowledge of materials and methods that can be gained only from broad experience. Through this experience—in every aspect of metal processing—Honeywell has developed special techniques and equipment for measuring high temperatures.

Honeywell offers you the sum total of this experience in engineering assistance and an all-inclusive line of instruments, special-purpose measuring devices, thermocouples and accessories. Combined, these tools and techniques can give you better products and day-to-day production economies.

Your nearby Honeywell field engineer will be glad to discuss your requirements. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

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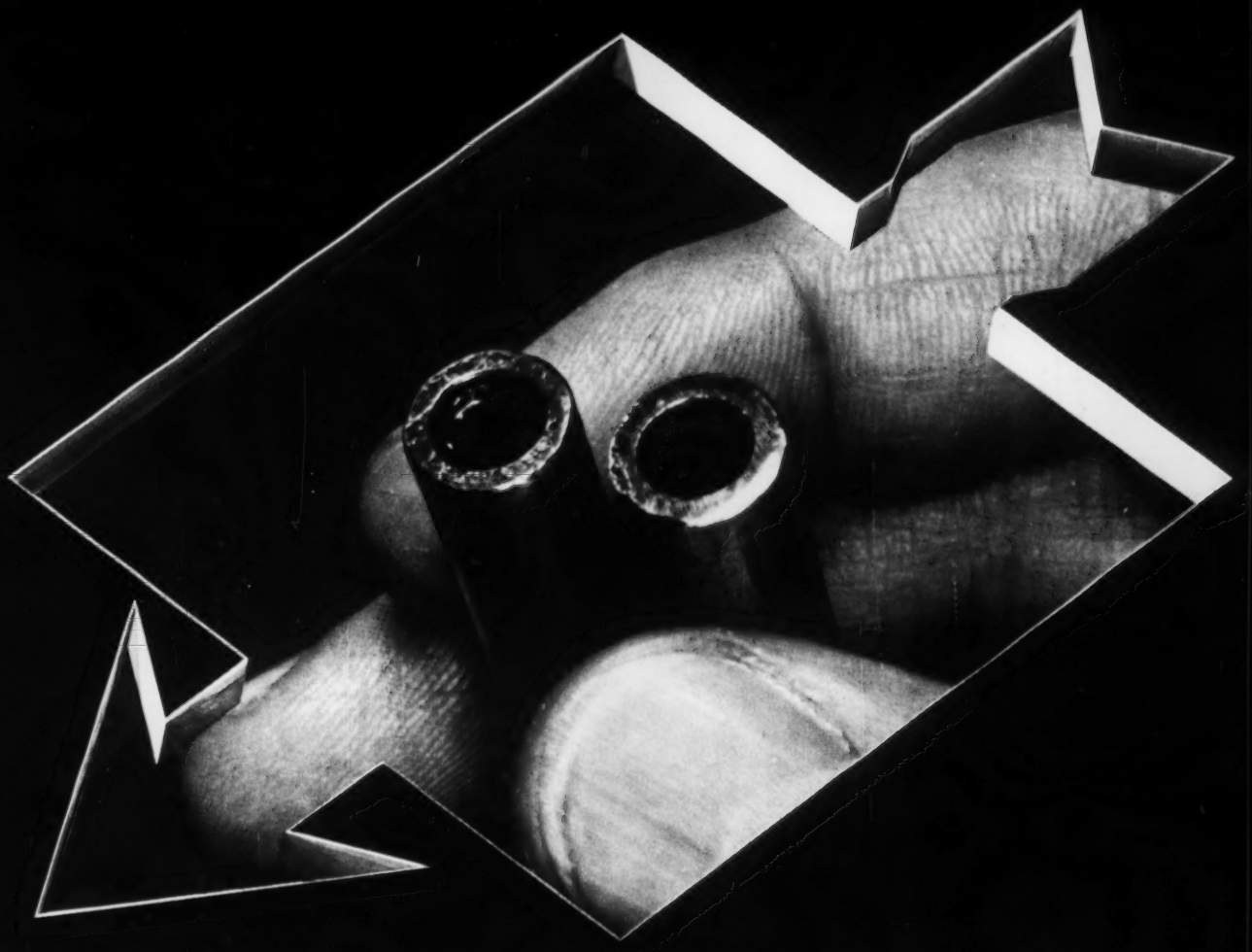
First in Control

Quality–the best economy of all



Two oils...two lines...one clogged...one cleaned

A Sunvis 700 oil and a regular oil were run through two equally clogged hydraulic lines. The regular oil couldn't remove the sludge. The Sunvis 700 oil cleaned its line thoroughly. That's one job it's made for . . . to clean out sludge deposits in hydraulic lines while it transmits power.

With a Sunvis 700 oil—like every Sunoco oil—you enjoy the best economy of all: the economy of quality. A Sunvis 700 oil lasts longer. The machinery it protects lasts longer. It prevents rust . . . ups output by reducing downtime.

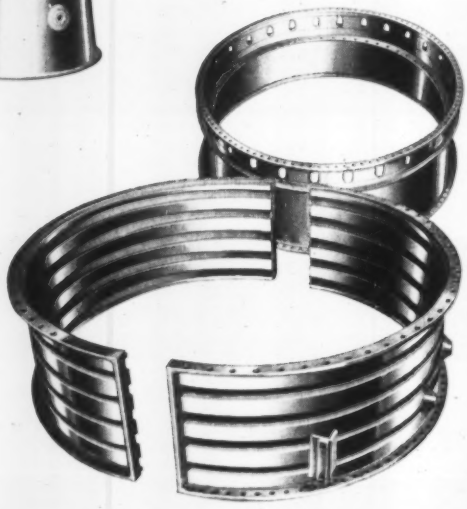
FREE Trouble-Shooting Chart will help you spot and cure common hydraulic system troubles. For your copy, write to:

Sun Oil Company, Philadelphia 3, Pa., Department I-12.

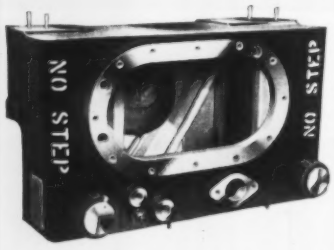
MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES

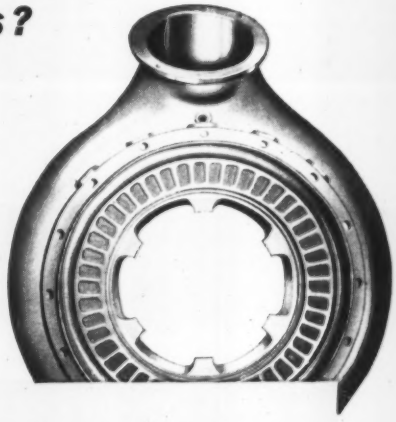
SUNOCO®

Looking for a Fabricating Source...



of welded precision assemblies?





As a major producer of circular parts and welded components for the aircraft industry, Amweld® possesses special knowledge and techniques for forming, welding, and machining of assemblies. Fabricating of aluminum, titanium, stainless, and heat-resistant alloys is a major part of this work. Experienced metallurgical and engineering staffs, plus a skilled work force, make up this team of fabricating specialists which is available to you on a subcontracting or experimental work basis.

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NEW booklet entitled, "HOW AMWELD FLASH BUTT-WELDED RINGS ARE PRODUCED."

The Case of the Vanishing Jobs

Since 1954, rising imports and declining exports have directly canceled 66,230 jobs in steel, autos, and machine tools. Indirectly, the job losses are much higher. In effect, those jobs have migrated overseas. How to bring them back? Narrow the wage gap between U. S. and other workers. In steel, for example, American workers get two to eight times what their counterparts overseas are paid (Page 99).

Kaiser to Join Steel Negotiations

Kaiser Steel Corp. is joining the ranks of 11 other steel producers who will bargain with United Steelworkers. The move should strengthen management's hand this year. Kaiser did not participate in the 1956 negotiations and its plants were not closed in the nationwide strike. After this year's first meeting, May 18 in New York, negotiations will be recessed until June 1, when talks will begin between each side's four-man team. Steelmakers represented will include Allegheny Ludlum, Armco, Bethlehem, Colorado Fuel & Iron, Great Lakes, Inland, Jones & Laughlin, Kaiser, Republic, U. S. Steel, Wheeling, and Youngstown Sheet & Tube.

Here's How to Sell 'Emotionally'

Here's news for your sales force: The industrial buyers they face every day are human beings. Watch your sales curve once your salesmen learn the buyer nurses many conventional ambitions and desires. STEEL's Marketing Workshop staff can tell you how to beard this buying lion in his office—and sell him (Page 104).

Labor Sees Spring Job Pickup

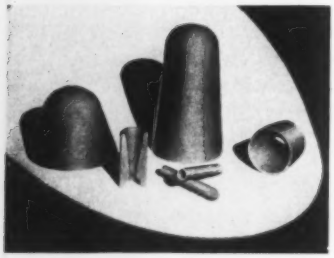
Steel, electrical, and fabricated metal industries are among those in which the Labor Department expects a "slight to moderate" employment upturn this spring. Substantial unemployment (over 6 per cent of the labor force) exists in 74 major U. S. cities. Eleven of these cities have 12 per cent unemployment.

Rails See Second Quarter Upturn

Twelve per cent more railroad freight cars will be loaded this quarter than in the same period of 1958, forecasts the Association of American Railroads. Biggest gain, 44.8 per cent, will come in the Great Lakes region; the Alle-

gheny area will be up almost 30 per cent. Gains of 12 to 16 per cent are expected in the Northwest, Pacific Coast area, and Midwest. Predicted increases in shipments of metalworking products: Ores, 63 per cent; iron and steel, 48 per cent; vehicle parts, 29 per cent; nonferrous metals, 11 per cent.

New Roles for Versatile Silicon Carbide



A form of silicon carbide may solve a high temperature problem for you. A relative old-timer in abrasive uses, it is now finding work as a structural material which can be formed into complex shapes. The superrefractory is used in rocket thrust nozzles and can stand up to hellish combustion chamber temperatures of 5000° F. Watch for it to appear in new electrical applications, even in your wife's jewelry (Page 115).

Titan Will Be Retained

Even after Minuteman (the solid fueled ICBM) goes into production, liquid fueled Titans will continue to be built, says the Pentagon. The Titan can handle a much bigger payload than the Minuteman; it will be stocked at permanent bases. The Minuteman may be mobile enough to be fired from railroad launchers. Even with the Atlas ICBM operational this year, it will most likely give way to the Titan next year.

Soviet Exports, Imports Rise

Soviet Union imports and exports rose between 1955 and 1957: Imports went up 29 per cent, exports 26 per cent. The U. S. Bureau of Mines says mineral and metal exports are increasing faster than the over all export rate: Minerals are 68 per cent and ferrous shipments 80 per cent higher (Page 102).

Total Exports

1957	1956	1955
	(In millions)	
$4,381.5	$3,669.2	$3,468.6

Total Imports

$3,937.8	$3,613.1	$3,060.6

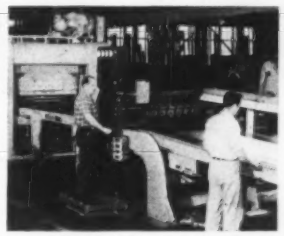
Lockheed Links Missiles with Ships

Lockheed Aircraft Corp. is entering the shipbuilding industry with the acquisition of Puget Sound Bridge & Dredging Co., Seattle. Lockheed sees a tremendous future for the Navy's submarine launched, solid fueled missile, Polaris, and wants to build the submarines as well as the missiles. Navy plans call for 15 Polaris launching subs, but pressure on Capitol Hill may boost the program to 27 vessels by 1962. The submarines will cost about $100 million each.

GE Rents Industrial Equipment

If you need an expensive instrument for short term usage, you might want to take advantage of a loan plan sponsored by General Electric Co. GE has established a pool of 13,000 measuring instruments for rental, available through the firm's nationwide chain of service shops. You may, for example, rent a de luxe $1500 oscilloscope for $75 a month, maintenance free. The array of available instruments ranges from audience reaction meters to tuning forks.

Costs Topple in Switch to Coil Handling

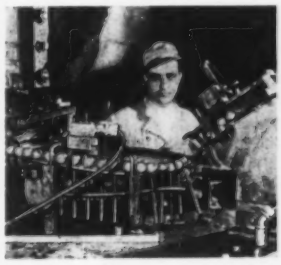


Steel coil processing will enable General Fireproofing Co., Youngstown, to save 5 per cent in steel costs alone this year; overall operating savings may come to 10 per cent. By switching from the use of sheets, the metal furniture manufacturer wastes less steel in shearing, can adjust specifications rapidly to meet a fast moving market (Page 166).

Factory Built Homes Set Record for Year

Production of 110,080 factory built home units broke all previous records in 1958. Gain over 1957 was 18 per cent. The Home Manufacturers Association reports that the industry accounted for 11 per cent of the 977,300 new, single family homes started in the U. S. last year. Distribution of the houses was heaviest in Ohio. Illinois, Pennsylvania, and Indiana ranked next in that order.

Induction Heating Can Trim Costs



If there's a hardening, annealing, forging, or extrusion operation in your plant, induction heating equipment may help you get more from your heating dollar. Case studies collected by Westinghouse Electric Corp., Baltimore, show its effective use in several applications. Heat is developed rapidly, right in the material being processed; so there's no thermal lag and minimum scale (Page 146).

Coal Wages Up, but Some Prices Down

Last week, soft coal miners' wages went up 80 cents a day, but cost of bituminous fuel to some electric power companies went down. That came about as a result of co-operation between the coal industry and railroads to pare freight rates to meet the competition of imported residual oil, which some eastern seaboard utilities had threatened to use. The 80-cent wage

boost is part of the $2 coal wage package negotiated earlier; $1.20 of it went into effect Jan. 1. Miners' wages today are 60 per cent higher than they were ten years ago, but soft coal at the mines is priced slightly lower.

Little Woman Heads for Washington

It's possible: Your wife may win appointment to the President's Cabinet. A march of the little women on Washington is in the offing if Congress passes Sen. Estes Kefauver's (D., Tenn.) bill proposing a federal consumers' department. Such an agency could probe into consumer goods industries, distribution setups, and prices. The plan for a direct voice in Washington has long been pushed by consumer groups; it seems to have Congressional support (Page 110).

Federal Subsidy Set for Shipbuilding Project

The Federal Maritime Board will subsidize 48.3 per cent of building costs for four cargo ships, under a $44 million contract signed with American Export Lines. In fixing the subsidy, the board used Japanese construction costs for comparable vessels as a standard. The subsidy will amount to the differential between U. S. and Japanese costs. The ships will be built jointly by National Steel & Shipbuilding Corp., Morrison-Knudsen Co., Henry J. Kaiser Co., Macco Corp., and F. E. Young Construction Co., at National Steel's shipyard in San Diego.

West Germany Opens 'Big Board'

First experimental steps are being taken to transform West German industry from state ownership to capitalism by selling industrial shares to the public. Government ads urge socialist minded workers to buy while prices are low ($42 shares for $34.80). Initial offerings are small but eventually the government hopes to get out of business altogether, leaving $1.7 billion worth of mines and factories to ownership by individuals.

Straws in the Wind

Underwriters are offering $75 million in Armco Steel Corp. 4.35 per cent sinking fund debentures. Armco will apply the proceeds toward cost of additions and improvements . . . General Electric Co. has cut prices on silicon controlled rectifiers. The cuts range from 6 to 44 per cent . . . The U. S. Chamber of Commerce argued against Sen. Estes Kefauver's (D., Tenn.) bill S. (11) proposing to restrict price reductions unless they are offered to all customers . . . A fleet of 28 U. S. warships, led by the heavy cruiser *USS Macon*, will steam into the Great Lakes in June as part of St. Lawrence Seaway opening celebrations in 23 cities.

SPECIAL REPORT
Steel Buyers Get Strike Fever:
Hedge Buying Begins
IRON AGE
June is still a long way off.
through May and April. The
'May Be Too Late—The situ-
tion in Pittsburgh indicates a na-
tionwide trend is in the making.
Market Outlook
STEEL
With Stocks at Low Ebb, Rush Is on
DEMAND for steel is rising rapidly as consumers
strive to replenish low inventories. Fabricators
who let their stockpiles decline last year are sud-
denly realizing that they don't have enough met-
porary." Taking an opposite stand (though he
foresees no allocations), a mark-
clares: "I think we'll

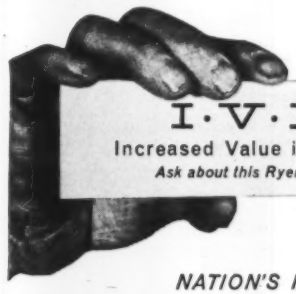
Report on Ryerson stocks as steel squeeze tightens

Steel stocks at Ryerson are at an all-time record high—in tons, types and sizes. Fortunately, Ryerson anticipated a squeeze situation and began laying in stocks of steel *months ago.* You can depend on Ryerson to furnish steel of high, uniform quality and to maintain its regular policy of fair, published prices.

Avoid loss of cost controls

Don't let the steel squeeze trap you into scrapping cost control programs based on sound inventory policies. You've proved the economies of avoiding long-term commitments—and the high "cost of possession" that goes with them. Call Ryerson for risk-free steel buying and get the steel you need when you need it—cut to exact size and ready to use.

Your Ryerson representative is well qualified to review the facts and help you get the maximum value for your steel-buying dollars. Ask him to analyze your requirements with you the next time he calls.



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NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

How DSC-PORTSMOUTH Long Production Run

LPR COILS Can Help You Cut Fabricating Costs

REPORTS of Typical LPR User Experiences

- Downtime frequency due to coil changes and machine adjustments, as well as coil remnant scrap losses reduced as much as 92.8%
- Unloading time cut 16% to 50%.
- Overall man-hour costs cut 15% to 20%.
- Inconveniences of "returnables" eliminated.
- Small coil racks discarded.
- Storage space reduced 15%.

THESE AND OTHER LPR EXTRA BENEFITS COST YOU NOTHING EXTRA OVER TRADITIONAL SIZE COILS

LPR

CONTINUOUS LENGTH BRIGHT WIRE COILS

LOW AND MEDIUM CARBON

.072″/.500″ inc. (to about 4200 lbs.)
.023″/.071″ inc. (to about 1000 lbs.)

HIGH CARBON

.072″/.250″ inc. (up to about 4200 lbs.)
.023″/.071″ inc. (up to about 1000 lbs.)

COIL DIMENSIONS ON REQUEST

POWER HOUSES OF WIREWORKING EFFICIENCY

Each LPR coil is a self-contained cost reduction program combined with a ready-built materials expediting system. To learn how LPR's might help save you wireworking time and costs, call your nearest DSC Customer "Rep" or write us at Detroit . . . today?

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CUSTOMER "REP" OFFICES:
Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio, Dayton, Ohio, Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Houston, Texas, Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York City, Rochester, N. Y., St. Louis, Toledo, Worcester, Mass.

The PROOF of DSC STEEL is in its PERFORMANCE on Your Job

DSC PRODUCTS: Coke . . . Coal Chemicals . . . Pig Iron . . . Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods . . . HR and CR Sheet and Strip . . . Flat CR Spring Steel . . . Manufacturers' and H.C. Specialty Wire . . . Welded Wire Fabric

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What Now, Mr. McDonald?

Within the next few days, your United Steelworkers of America executive committee will map the strategy for the coming wage talks with the steel industry. Its recommendations presumably will be endorsed by your 170-man wage policy committee meeting Apr. 30 and May 1.

When you meet with representatives of steel industry management in New York on May 18, you will have 42 days to negotiate before the June 30 strike deadline arrives.

Most people think that the steel industry will begin pulling the fires from its furnaces on June 29 because it fears you will not agree to anything less than a "billion dollar" package.

In the meantime, many users of steel products may have loaded up on supplies that will carry them well through the third quarter.

If the strike lasts for more than a couple of months, consumers can call on foreign steel producers for fill-in supplies. As you know, steel imports have been rising; exports have been falling. The result is fewer jobs for American steelworkers.

Equally important to you are the rumblings in Washington. President Eisenhower thinks the settlement should show moderation. He doesn't want an increase in prices.

Vice President Nixon's new Cabinet Committee for Economic Growth is studying ways to expand the economy without wage-price inflation.

Sen. Estes Kefauver warns of mounting pressure for government wage and price controls to stem the tide of rising prices.

Some congressmen still want to reduce the monopoly powers of labor unions.

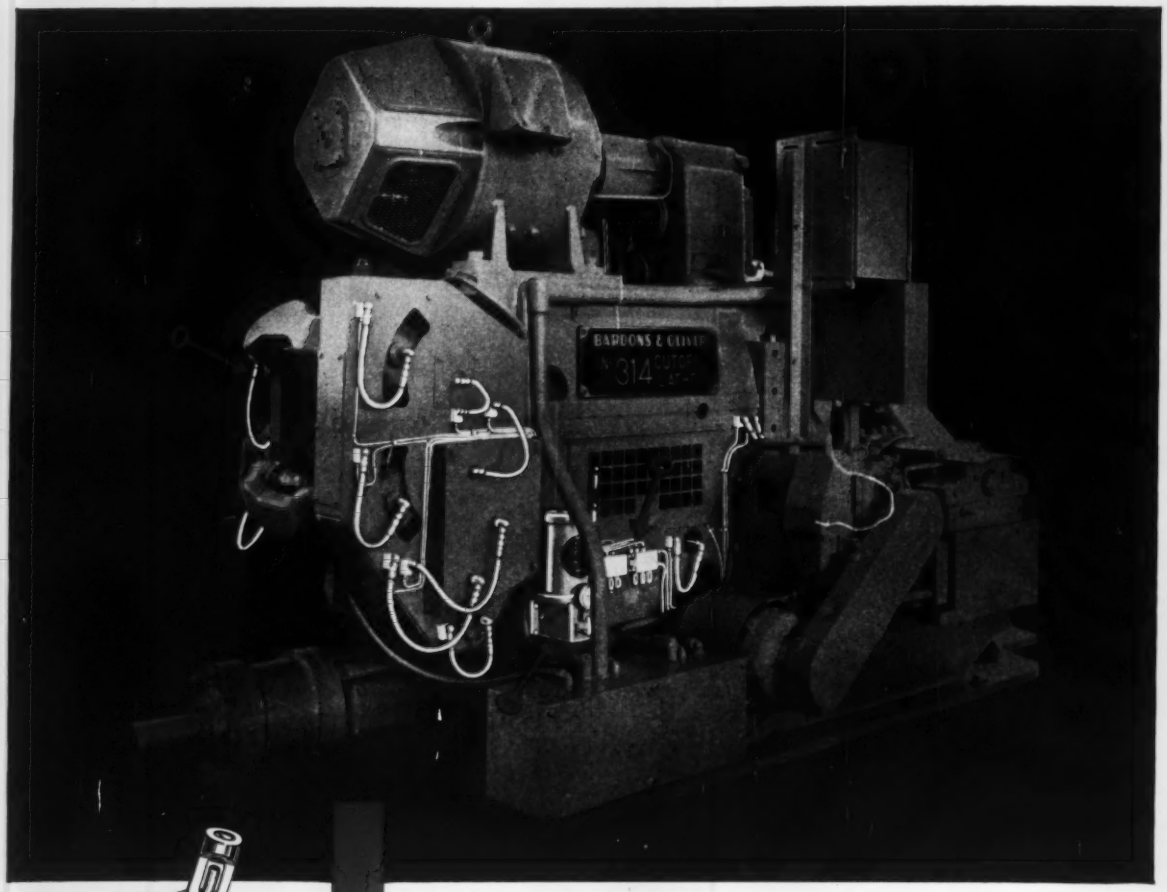
And the public will be listening to what you say and watching what you do in the next eight weeks. (Don't overlook the possibility of a buyers' strike that could hurt the sales of consumer products made of steel.)

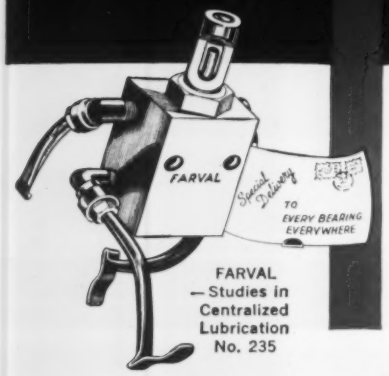
The situation calls for statesmanship on the part of the steel industry and especially you, Mr. McDonald.

So what now, Mr. McDonald?

Irwin H. Such

EDITOR-IN-CHIEF





FARVAL
—Studies in
Centralized
Lubrication
No. 235

Farval lubrication keeps productivity high on cutting-off lathes

Cropping and chamfering steel tubing and pipe—as well as cutting-off and chamfering couplings ranging in diameter from 5 to 14½ inches—requires a heavy, rugged cut-off lathe like this Bardons & Oliver No. 314. It must be dependable in service—give high productivity—provide long trouble-free service life.

Bardons & Oliver design engineers chose a manually-operated Farval Dualine Centralized Lubrication System to serve the lathe's 39 vital bearings. During the last 7 years Farval has lubricated many of these B&O's—and there hasn't been a single known bearing failure to date!

Remember, a modern Farval system can adequately lubricate hundreds of bearings from one centrally-located pumping station. Why not check with your local Farval representative and see how these versatile lubrication systems can help produce superior, more productive industrial equipment. Or ask for your free copy of Bulletin 26-S—it contains the complete "Farval Story". The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

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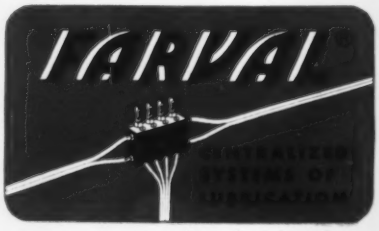
KEYS TO ADEQUATE LUBRICATION—wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.



The Case of the

VANISHING JOBS!

Imports are on the increase. Exports are on the decline. Result: Many Americans are losing jobs each year. STEEL reports on situation in three industries

I SAT in my cubbyhole office and read a pamphlet on family characteristics of working wives as compiled by the Census Bureau.

Repose and calm usually come to me after reading Census literature; its figures are so neat, so logical, so precise. Besides, they might provide a clue some day—for I am an industrial detective specializing in the recovery of missing persons.

But even the Census data failed to hold by attention that afternoon. I hadn't had a case in three weeks and not a worthwhile fee in more than a month. My last job had been to trace the whereabouts of a job-hopping engineer. I never found him, but I never got paid either.

I was just about to notify my phone answering service (only the Perry Masons can afford secretaries like Della Street) that I was going home when the instrument rang.

"Is this the Chance Detective Agency?" The voice at the other end of the line was muffled, as though filtering through a handkerchief.

"Yes, Acton Chance speaking."

"I have a job for you, Chance, and the retainer will pay your office rent for the next 14.6 months."

I liked the sound of 14.6, so I asked for details. They came quickly and precisely, although muffled. My prospective client represented the steel, auto, and machine tool industries. For several years, but particularly since 1954, jobs had been vanishing. Where had they gone? Why? How many?

"Aren't some of them going because of job mechanization?" I asked.

"We know all about those. The disappearing jobs I'm talking about we can't account for. We want you to."

And so began the biggest case I've ever worked on. For three weeks I traced statistics from here to Washington to New York, to Philadelphia, to Houston and Galveston, to San Francisco, to the Great Lakes ports. For many days I interviewed Customs officials; for many nights I stood in the shadows of the warehouses at our great docks—watching, waiting.

Finally, I had my facts, and this is the report I wrote:

America has been an exporter and importer since colonial days. The character of that trade has changed many times over the last two centuries, but never has a shift come as rapidly as that since the end of World War II.

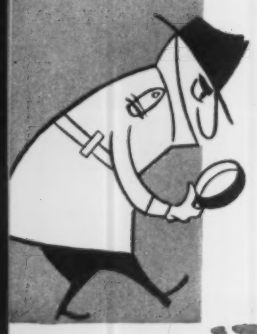
Europe and Japan, with American help, got on their industrial feet quickly. After satisfying much of their domestic demand, they be-

Clue 1

Wage Scales

(Hourly Steel Rate, 1957)

U. S. ¢¢¢¢¢¢¢¢¢¢¢¢¢¢¢¢¢¢¢¢	$2.917
Britain ¢¢¢¢¢	0.827
W. Germany ¢¢¢¢¢	0.694
France ¢¢¢¢	0.583
Italy ¢¢¢	0.550
Japan ¢¢¢	0.361



Can't Compete

Clue 2

STEEL INDUSTRY:

1.6 million tons LOST

1958 vs. 1954

IMPORTS UP	1.3
EXPORTS DOWN	0.3

	IMPORTS	EXPORTS
1958 (million tons)	2.1	2.4
1954	0.8	2.7

14,400 Fewer Jobs

gan turning to foreign markets, including the U. S. The result has been a rise in our imports of many manufactured goods and a drop in exports of those products that we also make.

As foreign quality and service rapidly improved, the key competitive point became price. Wage rates in the U. S. are two to eight times what they are overseas (see Clue 1, above). Even when Europeans and Japanese pay more for their materials and transportation than we do, they can undersell us with ease because of the wage gap.

German barbed wire makers sell their products in Pittsburgh at about $40 a ton less than those made in Donora, Pa. The Japanese, using premium priced American scrap, can undersell American producers of reinforcing bars by as much as $29 a ton. Practically every reinforcing bar used in Florida is imported.

Compare these foreign auto prices (at New York) with those of American made cars: Simca Aronde (France) $1575; Fiat 600 (Italy) $1298; Renault Dauphine (France) $1645; Volkswagen (West Germany) $1545. As recently as 1951, annual imports (cars and trucks) amounted to less than 25,000. The figure will hit at least 500,000 in 1961.

When the Air Force asked for bids on thirty-one 24 in. shapers, the lowest quote by a U. S. builder was $269,490. A foreign firm asked 112,000. Many American companies now have foreign plants. One can build its tools to U. S. specifications at its subsidiary in England, then bring them back to the U. S. for 30 per cent less than the machine made here—even after transport and tariff costs. Machine tool imports are ten times higher than they were in 1950.

Our exports of steel, autos, and machine tools are also slipping because of tougher competition from the lower priced European and Japanese products in our traditional export markets.

It's an old story to this nation's builders of ocean-going ships. If it weren't for federal subsidies, they couldn't compete against British, European, and Japanese pay scales.

U. S. watchmakers have seen how the same wage situation can cause the slow erosion of an industry. So have manufacturers of bicycles, sewing machines, electrical generating equipment, and other products.

Take a look at the purchases of heavy power transformers by the federal government, a big buyer of such apparatus: Twenty-seven per cent came from overseas in 1952, 50 per cent in 1953, 40 per cent in 1954, 60 per cent in 1955, and 80 per cent in 1956. The eight major domestic manufacturers of the equipment believe the trend "represents a serious threat to the security of this nation" because more and more of our vital power (which could be knocked out in time of war) is becoming dependent upon foreign servicing.

The export-import situation cuts down American business volume, too, meaning the government loses corporate and personal income tax revenues.

But the most important loss is in jobs. You can only get approximations here. Yet Clues 2, 3, 4 (see exhibits) give you an idea of how

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Clue 3

AUTO INDUSTRY:

520,310 units LOST

1958 vs. 1954

IMPORTS UP	423,196
EXPORTS DOWN	97,114

	IMPORTS	EXPORTS
1958	458,999	304,346
1954	35,803	401,460

48,650 Fewer Jobs

Clue 4

MACHINE TOOLS:

$31.8 million LOST

1958 vs. 1954

IMPORTS UP	$7 million
EXPORTS DOWN	$24.8 million

	IMPORTS	EXPORTS
1958 (millions)	$40	$53.7
1954	$33	$78.5

3,180 Fewer Jobs

many direct production jobs have been lost in the steel, auto, and machine tool industries since 1954. That's the year when the export-import trend began to pack a big wallop. Of course, the situation was shaping up even before then. One wire producer figures he has lost 25 to 30 per cent of his employment since 1950 as a direct result of imports.

The job-lost figure for steel was arrived at this way: Eighteen manhours of direct labor go into the average ton of steel imported and exported. Over-all, between 13 and 14 manhours go into a ton of steel, but much of that tonnage is the simpler material. The big imports are reinforcing bars and wire products. The major exports are structural shapes, plates, line pipe, tin plate, and cold-rolled sheets. They all require more manhours.

Comparing 1954 and 1958 statistics, the net loss in tonnage was 1.6 million tons. (Imports were up 1.3 million; exports were down 0.3 million.) To get the job-lost figure, find the number of manhours involved in 1.6 million tons (multiply by 18) and divide by 2000 hours, the normal number in a work year. Answer: 14,400 jobs lost.

Some industry men and statisticians use 187 as the number of manhours needed in direct labor to produce a U. S. car, including the major parts. With that figure, you arrive at the job-lost data the same way as in steel.

The statistical problem in machine tools is the most difficult of all because of the wide range of manhours needed for various tools and because the import figures are low. The value for Customs declaration put on machine tools is the value in the country of manufacture, not the price here. Also, industry observers believe many tools come into this country described as replacement parts when they are actually new machines. So the Customs figure for imports was doubled for our purposes. As a rule of thumb, assume that a production worker turns out $10,000 worth of equipment in a year. So when the total loss in machine tools is $31.8 million, 3180 jobs have been lost.

Since 1954, the export-import trend has had the effect of cancelling out 66,230 jobs directly in three industries alone. Consider the indirect effect. One set of figures shows the auto industry has lost 195,000 jobs, directly and indirectly, because of the foreign trade situation.

I reread my report, folded it, and put it in an envelope to be picked up by my client's courier at midnight. Some 66,230 jobs had been lost directly, many more indirectly. They had migrated overseas. How many more would go? The wage differentials would tell that story. If the pay gap between the U. S. and the rest of the world narrowed, some would come back. If it widened, more would vanish.

I shook my head, then reached for the office bottle of bourbon in the bottom desk drawer and filled a Dixie cup to the brim.

Unsolved Case of

66,230

FEWER JOBS

What's Your Solution?

Soviet Imports Are Rising Faster Than Its Exports

(Millions of dollars*)

Total Imports

1957	1956	1955
$3,937.8	$3,613.1	$3,060.6

Total Exports

$4,381.5	$3,669.2	$3,468.6

Examples of Imports

Minerals	$ 967.2	$ 931.8	$713.5
Ferrous Metals	163.5	145.6	71.1
Nonferrous Metals	127.7	143.1	133.1

Examples of Exports

	1957	1956	1955
Minerals	$1,519.7	$1,138.4	$904.0
Ferrous Metals	438.7	383.7	318.0
Nonferrous Metals	203.0	157.6	110.7

Source: Bureau of Mines.
*Computed at 4 rubles per dollar.

THE SOVIET UNION'S imports are increasing at a faster rate than their exports. Imports jumped 29 per cent between 1955 and 1957. Exports were up 26 per cent. Two exceptions: Mineral and metal shipments are rising at a greater rate than total exports.

Minerals sent abroad were up 68 per cent; nonferrous exports skyrocketed 80 per cent; and ferrous shipments kept pace with the overall growth. The figures reflect the Soviet economic expansion program and drive toward mineral and metal self-sufficiency.

• **Mineral Exports Up**—The ratio of mineral exports to total exports increased from 25 per cent in 1955 to 35 per cent in 1957. The import ratio (25 per cent) didn't change.

Expanding output and possible inventory reductions boosted nonferrous exports. Zinc, lead, aluminum, and tin had the biggest gain. There was little change in imports.

• **Ferrous Keeps Pace** — Ferrous metal shipments kept pace with the rise in total exports. Over half the goods in this category were structural steel shapes. Nearly a fifth was pig iron. Imports of rolled products from Free World nations offset most of the Soviet's ferrous metal exports.

Exports of ore and concentrates, primarily iron ore sent to European satellites, continued to expand, rising from $115.8 million in 1955 to $184.1 million in 1957. Imports increased from $251.3 million to $453.3 million.

The combined value of solid liquid fuel shipments in 1957 was $202.9 million, double the 1955 figure.

Apatite concentrates and asbestos head the nonmetal export list. Fluorspar, sulfur, and talc were principal import commodities.

AMC Charged Up Over Electric Car

LOOK FOR American Motors Corp. to take a radically new tack in transportation. It's exploring the possibilities of an electric auto with Sonotone Corp., Elmsford, N. Y.

Aim of the joint effort: To develop an electrical powerplant which would be constantly recharged during a vehicle's operation. The source: A generator driven by a small, high performance engine.

• **Drawbacks of Electrics**—Present electric cars are best for city travel. Cross-country jaunts have to be interrupted every 100 miles to recharge the batteries. Normal recharging of common lead-acid batteries takes 8 hours.

The heart of the new project will be a sintered plate, nickel cadmium battery like those used in missiles and jet aircraft. Introduced in the U. S. by Sonotone, it is smaller and lighter than conventional batteries of comparable energy output.

• **Cost vs. Life**—While it costs substantially more to produce, it can withstand great overloads and can be recharged in a fraction of the time needed for conventional batteries, says Irving I. Schachtel, Sonotone's president. The original battery is expected to last the life of an electric auto, he adds. (The period could be lengthy. One laundry in New Jersey uses electric trucks that have been gliding around on deliveries for 49 years.)

"If this project is successful, it could open up a whole new area of automotive power," says George Romney, AMC president. Only a month ago, AMC officials denied interest in selling or marketing such a vehicle. (See STEEL, Mar. 2, pp. 74-75.) The company provided a stripped Rambler American to be used for prototype development of an electric auto by Cleveland Vehicle Co. The Cleveland firm also makes and sells a battery-

powered, Fiberglas delivery van. A three passenger electric car is being manufactured by Stinson Aircraft Tool & Engineering Co., San Diego, Calif.

• **Experimental**—Mr. Romney cautions: The new program with Sonotone, which could take several years, might not result in a vehicle which would prove feasible and economical, but: "We decided to launch this development project to see if a more efficient automobile might result."

Researchers will seek answers to questions of cost, economy of operation, performance, vehicle size, and weight. Work will be done at plants of both companies.

Chrysler's Small Car Due in December?

CHRYSLER'S small car is ready to go and the company will decide this summer whether or not to produce it, says L. L. Colbert, Chrysler Corp.'s president. Most of the tooling has been purchased.

If approved, production will start in November. It will be introduced in December, about a month later than the rest of the corporation's 1960 line. It probably will be built in a Detroit plant initially (Dodge Main is the rumored site), but Chrysler has two other plants in mind—one of them out of state, possibly in Delaware.

• **Light Metals**—Light metals will be used extensively to cut weight, says Mr. Colbert, but he does not say whether it will have an aluminum engine. It has a wheelbase between 105 and 110 in. (reportedly 106 in.) and consequently won't compete with Chrysler's 96 in. imported Simcas. Mr. Colbert adds: "We aren't sure that these cars will be a smash hit because they cost almost as much to produce as our present low priced Plymouths. Labor costs make up 80 to 85 per cent of the cost of a car."

Chrysler will begin fabricating its own glass for windshields, backlights, and side windows in one of its renovated Detroit stamping plants. Production will start early next year, and Mr. Colbert asserts that within three years the company expects to be making 50 per cent of its glass requirements. It plans to produce tempered and laminated sheets, and plate glass.

• **Looking Ahead**—Mr. Colbert says that if there is a steel strike, he expects it will be concluded before November. He adds that the corporation will have enough steel in inventory to finish its 1959 model run and to carry it 45 days into 1960 models. Word around Detroit is that Chrysler is leasing warehouses for stockpiling. It's also asking venders to carry some of the load for fabrication of parts. By June 30, it's figured that Chrysler will have about a 14-week supply of steel on hand.

• **Sees Good Market**—Mr. Colbert reaffirms that 5.4 million or 5.5 million domestic passenger cars will be sold in the U. S. this year. He believes 400,000 imports also will be sold. Chrysler accounted for 10 per cent of the market in the first quarter, and still is looking at 20 per cent penetration for the year. It plans to deliver 100,000 cars a month to dealers through July.

ASM Picks Putnam

American Society for Metals appoints managing director, a new position

ALLAN RAY PUTNAM is the new managing director of the American Society for Metals.

He will occupy the new position established by the society's board following the death last May of William H. Eisenman, a founder of the society and its national secretary and executive head for 40 years.

The new managing director is assistant executive secretary of the American Society of Tool Engineers, Detroit. He will assume his new post as soon as his commitments in Detroit are finished.

• **New Headquarters**—In midsummer, the society will move into a new headquarters 23 miles east of downtown Cleveland. The new building, which will house more than 100 staff members who serve the 106 chapters of the organization, is distinguished by an elaborate landmark, the world's largest geodesic dome or "space lattice."

The 30,000 member society sponsors the National and Western Metal Shows and the Southwestern Metal Exposition.

• **Emphasizes Education**—The society is broadening its educational program and has plans for increasing its output of reference and technical books covering all phases of the metals industry. It also offers a home study and inplant training program through its Metals Engineering Institute.

Mr. Putnam was graduated with a degree in economics from the Wharton School of Finance & Commerce of the University of Pennsylvania in 1942. After serving four years in the Army Air Force as a captain, he joined the American Electroplaters Society as business manager. In 1949, the American Society of Tool Engineers appointed him assistant executive secretary and publisher of *The Tool Engineer*.

He is president of the Council of Engineering Society Secretaries and was president of the National Association of Exhibit Managers in 1955.

Mr. Putnam is also a member of the American Society of Association Executives, American Management Association, National Industrial Advertisers Association, American Marketing Association, American Dialect Society, and the Engineering Society of Detroit.

ALLAN RAY PUTNAM
ASM's managing director

11 TIPS

About the Personality Of Your Metalworking Manager

1. He's plagued with aggressive urge to advance, countered by submissive desire to stand fast

2. Likes to share buying responsibility; feels safer if he is a part of group buying team

6. Likely to be a conformist, an organization man. Though he may deny it, it's usually by choice

7. He's status minded. Wants to grow, help his company grow, be a hero, advance his station in life

8. He's security minded. Wants to play it safe, please his boss, be accepted by his associates

How to Use Emotional Factors That Trigger Industrial Sales

HERE is a man you know well . . . Mr. Consumer Buyer. (Or is he really two men? We'll go into that later.)

He dragged out of bed this morning sporting a man-sized hang-over achieved by drinking a bourbon "worthy of his trust" . . . knowing that "relief is just a swallow away," he lights up a cigarette "designed for men that women like" and heads for the shower.

He uses a soap that "he wishes everyone else did" . . . shaves with a razor blade that makes him "look sharp, feel sharp, be sharp" . . . dons clothes that make him "look like the man he'd like to be" . . . and he's ready for a cereal that's "shot from guns" and, incidentally, for which his son received a Boom Boom Boomerang and a genuine Mau Mau shrunken head.

Across the table is his devoted wife. Last night she "dreamed she was book ends in her Maidenform bra." This morning she's more convinced than ever that "it's what's up front that counts." She gives hubby a "kissing-fresh" farewell, and he's off to the office "confident that he will be looked at and admired" in his "car with the forward look."

So far this morning Mr. Consumer Buyer has been the beneficiary, or victim, of his own, his wife's, or his child's conscious or unconscious susceptibility to advertising and selling—*consumer style*. He has permitted himself to be led, cajoled, even pushed into purchases he did or did not want, did or did not need, could or could not afford.

He has bought on impulse . . . emotionally . . . virtually involuntarily . . . he was spending his own money to make himself feel better, more desirable, more important, safer.

A Different Man?

When Mr. Buyer arrives at his place of business, most industrial marketers believe a metamorphosis takes place. (This is the "second man" bit we referred to earlier.)

Mr. Consumer Buyer is now Mr. Industrial Buyer. He's no longer the pawn of advertising, no longer the fulfiller of his wife's or child's whims, no longer reckless, extravagant, emotional. Now he's spending someone else's money, so he does it cautiously, economically, intelligently, with judgment, wisdom, and reason. So it would be disastrous, following the two-man theory, to

3. The more two products are alike, the greater his emotional involvement in selecting brand or supplier

4. He won't always tell you what he really wants or how he feels. Often tells you what he thinks you want to hear

5. Feels that honesty, hard work mean security. Will often shuffle papers to appear hard working

9. He watches competition. Is more likely to take buying action if his competitor already has

10. Is as impressed as much, sometimes more, with the reputation of the supplier as by the product

11. Fear is the most basic emotional factor influencing the buyer's purchasing decisions

appeal to Mr. Industrial Buyer's heart instead of his head. You must sell him on his own terms, which, we are told, are 99 per cent rational.

For a long time, the editors of STEEL have suspected that the industrial buyer is *one man, a human being, all the time* . . .that he makes all his purchasing decisions (consumer and industrial) on emotional as well as rational bases.

So the editors commissioned Dr. F. Robert Shoaf, motivational research consultant and assistant professor of marketing, New York University, to find out:

1. Why the metalworking manager buys.
2. Why he selects one brand or supplier over another.
3. What type animal he is psychologically.

Here's how the research was done: Eighteen industrial cities with plants representing all of metalworking's Standard Industrial Classifications were selected. Managers in administration, production, engineering, and purchasing were chosen. Interviews covered 137 managers in 70 plants.

ABOUT THIS STUDY . . .

Here are data covering a prime area of marketing never before fully explored . . . data that promise to open new, exciting avenues for more effective selling and advertising to metalworking.

The study was conceived by STEEL's editorial staff. Its purpose was to explore the emotional factors motivating the metalworking manager and thus establish new and improved lines of communication with him.

STEEL's study is the result of unique collaboration among specialists in four fields . . . motivation, selling, advertising, and magazine publishing. It was done under the auspices of STEEL's Marketing Workshop, established in 1957 for the purpose of developing new, practical research for use by industrial marketing men selling to metalworking.

Members of STEEL's Workshop are Walter J. Campbell, editor, STEEL, expert on communications; Dr. F. Robert Shoaf, motivation research consultant, assistant professor of marketing, New York University; Howard G. Sawyer, vice president, James Thomas Chirurg Co., expert on advertising readership and evaluation; and Dr. Hector Lazo, managing director, Marketing Counsellors, and professor of marketing at the New York University graduate school.

Method: To study the "why" of behavior, Dr. Shoaf had to probe for motivations. He knew that if he asked "why did you buy product A?" or "why do you prefer product B?" the interviewee would not admit that he had acted emotionally, purchased impulsively, or that his buying reflected his personal status symbols of worldly success. He would rationalize his behavior to impress the questioner.

To get beneath rationalizations, Dr. Shoaf developed a modified, open-end questioning approach for busy, executive personnel. He obtained frank and interesting testimonials about purchasing habits,

each complete with case histories to back them up. But, equally important, he also obtained information on the value judgments of this man and a fair appraisal of his personality, his goals, his joys, his fears.

Now Hear This

Here are Dr. Shoaf's major findings:

1. The industrial buyer is more human in his buying habits than industrial marketers realize.
2. While administrative, production, engineering, and purchasing managers are different in function, they all have common management interests.
3. Needs exist everywhere in industry, but industrial marketing is not doing a sufficiently creative job of changing them to wants.
4. To the extent products and services become more alike objectively, the buyer's final decisions are based more and more on subjective emotional factors.
5. Your customers are your best prospects.

Let's take a closer look at each finding.

Major Finding No. 1

The industrial buyer is more human in his buying habits than industrial marketers realize.

The composite metalworking manager has the same biological needs and psychological drives, urges, and desires as you and I. His method of adjusting, however, is peculiar to his environment—in this case his vocation.

His composite personality is quite complex. He is likely to be a conformist and organization man . . . by choice.

Upon entering the employ of a given company, he studies the ground rules. He soon learns that hard work, productivity, and conformity mean security.

When he speaks freely of his aspirations, his fears, and resistances, we find the industrial buyer is plagued with an aggressive urge to move ahead, which is countered by a submissive desire to stand fast. He is status minded, wants to grow, help his company grow, be a hero, advance his station in life. He is also security minded, wants to play it safe, impress his boss. He is complacent and comfortable. The victim of inertia, he often resists change.

Major Finding No. 2

While administrative, production, engineering, and purchasing managers differ functionally, they all have common management interests.

1. They identify themselves with the welfare of the company, i.e., profit and loss, more efficient production, better products, personnel relations, and corporate image.
2. They closely scrutinize business competitors.

A manager of manufacturing engineering in Akron explained his management interests this way: "When I was a superintendent, I didn't care too much about the cost of a machine. If we got it, it had to pay its way. I have had an awakening since being promoted to manufacturing engineer. I look at the total cost picture now."

A recently appointed vice president of engineering at Hartford described his management interests in these words: "I am more than a vice president of engineering. My duties are becoming more involved with personnel and union problems. I'm now an adviser to the president. I'm a real troubleshooter."

"Keep your eye on the competition" is the byword. A Utica president says: "We keep up with progress by keeping our eyes on our competition. We like to know what they are up to. If they buy, we have to buy."

Major Finding No. 3

Needs exist everywhere in industry, but industrial marketing is not doing a sufficiently creative job in changing them to wants.

It's fact, not fancy that most decisions of metalworking managers are based on emotion. Evidence: The conservative manager who fights change for the sake of tradition; the overcautious manager who hesitates to make decisions for fear of making a mistake and looking bad in the eyes of his boss or his associates.

To the extent that resistance to purchase is based on emotion, logical arguments and presentations are ineffective. Such men are far more responsive to marketing strategy based on emotion.

The conservative is a follower by nature. He keeps his eye on competition and is more likely to take action if his competitor moved first. He hesitates to lead, but he will follow. You can score with this type individual by showing him *when he is not* keeping up with competition.

Whenever the overcautious manager involves himself in a decision, he feels he is taking a risk. He doesn't like being the guinea pig. He needs guarantees of good faith. Marketing promotion should emphasize satisfied and enthusiastic users of your products.

Even so, some of these men will always shy from decisions to purchase. In addition to assurance, they want group support. For ego bolstering, they look to other members of the group buying team. So in all major purchases, all members tend to share the buying responsibility. Each feels safer, since none wants to be in the boat alone.

Major Finding No. 4

To the extent products and services become more objectively alike, the buyers' final decisions are based more and more on subjective emotional factors.

There are considerably fewer basic differences among competitive industrial products than our salesmen and advertising would have us believe. In a competitive economy, a product with built-in superiority does not stay superior for long. What then, are some of the factors which often determine the selection of one brand or supplier over another?

Good delivery is one of the most important. It was the most frequently mentioned service "must" in STEEL's study. You might well say that there is nothing psychological about late delivery. Dr. Shoaf does not agree. He says: "I submit that late delivery can cost the customer *more* than disruption of his production schedules. It influences the image of the supplier in the buyer's mind."

Late delivery is a broken promise. It's a lack of sincere interest. It is also injurious to the pride of the buy-

10 Ground Rules for Salesmen

Who Want to Sell Better Emotionally

1. Keep Delivery Promises

A broken promise causes customer to lose face; reflects on his judgment. Prompt delivery makes him look good; you get reflected glory.

2. Don't Sell Price Alone

Customers don't like to be known as "price buyers." Give them ideas they can rationalize—quality, performance, cost reduction. Feed their egos.

3. Present Buyers Are Best Prospects

You've already sold him—now convince him he was right. Give him attention and service, and he'll buy even more.

4. You Are Your Company

The buyer sees you as a personification of your company. Reflect its corporate image in the way you dress, act, and talk. Be honest, reliable, and friendly.

5. Make Buyer Feel Important

Assure him that you appreciate his business. Don't take him for granted. He expects personal attention. Don't win arguments and lose sales.

6. Don't Overlook Little Things

Buyers are creatures of habit. Habits are made of little things. Make it easy for him to buy from you. He'll expect you to remember the big things —remember the little ones, and he'll be pleasantly surprised. So will you.

7. Concentrate on Thought Leaders

Some men have more influence than others. They are more progressive, ambitious, daring. Find these men. Show them how your product will make them bigger, more important.

8. Study Your Sales Contact

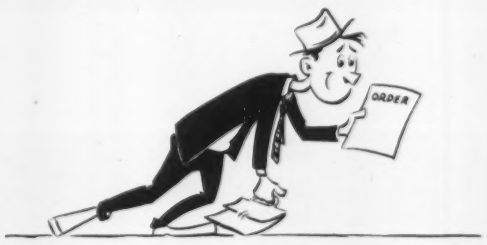
Know everything you can about him. The kind of man he is, what he does, where he's going. If your product can help him get there, show him how.

9. Win Consideration

Needs for your product exist everywhere. Change them to wants. Sell your product's virtues, but sell your company's reputation. Once you get your prospect to listen, be sure he is understanding.

10. Reassure the Buyer

Fear is his primary motivation. Fear of erring, fear of upsetting the boss, fear of looking bad to his associates. Stand behind your product; guarantee satisfaction; build company reputation for reliability; show satisfied customers.



58% Want Prompt Delivery

Late delivery is a broken promise, indicates lack of sincere interest . . . causes buyer embarrassment, loss of prestige

33% Want Personal Attention

Some like authority image of large supplier; all prefer friendly, helpful service. All expect interested attention

28% Demand Product Service

Installation, adjustments, debugging, technical assistance, quick service in emergencies are supplier musts

. . . Buyers Expect These Services from Suppliers

er—to his status—reflecting upon his ability as a buyer. Some buyers become emotional to the point of vehemence. A purchasing director in New York explains: "When a vender doesn't meet delivery dates, it shows a poor attitude. Hell, we must not be important to them . . . I like to deal with people that *act* like they really *want* our business."

Second only to delivery is the desire for *product service*. Literally dozens of testimonials reveal that surprisingly few manufacturers have the reputation for making sincere and consistent efforts at service followthrough—another sign of disinterest in the customer. Buyers shy from venders with poor service reputations. They fear that they will be left "holding the bag."

Corporate Image: There is no denying the importance of corporate image as a buying stimulator. People feel safer dealing with a company they know.

Some buyers desire association with the old, established, reliable; others prefer the young, dynamic, progressive. You can create the image you want. But while the corporate image is important, *it does not mesmerize*. Even from an old, reputable company a new type of equipment must be justified. Corporate image is important to the extent that it serves as a reminder when the buyer is seeking suppliers, but it does not necessarily stimulate him to action.

Size of Company: Your metalworking buyer enjoys identification with the prestige-authority image of the industry giants . . . whether he is urged by his insecurities to identify with authority, or is driven by his pride to associate with prestige. The corporate image of size can represent safety or status, or both.

But large companies sometimes appear unapproachable, standoffish. Small venders seem warm and friendly by comparison . . . more apt to give personal service. In the final analysis, the buyer makes his selection of large or small on the basis of personal value judgments.

Dr. Shoaf suggests that you spend your marketing dollars to look neither big nor small. He recommends: Look helpful and friendly.

Major Finding No. 5

Your customers are your best prospects.

Marketers are becoming so enraptured with the mysteries of unexplored markets and methods of exploiting them that they often overlook the obvious: The people who are buying your goods and services today. Your customers are *not* inclined to seek new suppliers as long as you are doing a good job. Even when a new type product is desired, buyers first seek out their suppliers for information on sources.

Most loyalties to suppliers thrive on delivery and service as long as product quality and price are in line. Recognize the fact that your best prospects are your present customers. With industrial expansion gaining momentum as we head into the "Soaring Sixties," their orders alone represent growth possibilities each year.

THREE THINGS SALESMEN DO BEST . . .

1. Keep customers happy through attention, service, and friendship

2. Create new customers by promoting product virtues, demonstrating values

3. Create customers through specific proposal, negotiating, pressing for order

41% Look for Satisfied Personnel

Buyers feel they are more likely to get good products from companies that employ a "happy crew"

39% Look for Honesty, Sincerity

Buyers want to be treated honestly, fairly. They are most critical of pricing, product performance, overselling

29% Stress Product Quality

Venders' reputation for quality products, sales service, financial solvency are all part of this picture

...They Prefer Suppliers with These Qualities

Conclusions

1. Fear, Dr. Shoaf believes, is one of the major influences in industrial buying. The buyer is afraid of displeasing his boss—and his associates. The average person won't risk substantial sums of his or his company's money on unproved products or unreliable companies.

2. *Who the manufacturer is* is as important, sometimes more important, than what the product is. The company behind the product is always part of what the customer is buying.

This second point suggests that we take another look at the fundamental relationship of selling and advertising. Too many people in industrial marketing overlook this fact:

> "Salesmen should be expected to do what they can do best; and advertising should be expected to do what it can do best."

What salesmen do best: 1. Keep the customer happy through attention, service, friendship. 2. Create new customers by using his point-of-sale talents to promote the virtues of the product, make a specific proposal, counter resistances, negotiate, answer questions, press for the order.

What does advertising do best?

Sometimes, it's the best way to broadcast information—over more ground and faster than salesmen can do it.

Sometimes, it's the best way to widen the market by revealing new areas or new uses.

Sometimes, it's the best way to attract leads, or influence stockholders, or even convince present customers.

Sometimes, it's the best way to *sell the company* that's behind the product.

With product differences becoming less discernable (and less significant in the selection of brand or supplier), buyers must weigh other values: You'll find them in the people behind the product, but they're talked of in terms of the company, its skills, its services, its reliability, its delivery performance.

It follows that it is desirable, often mandatory, to leave a favorable emotional impression of your company in the minds of everyone who has a say in purchasing decision.

Sales and advertising promotion to metalworking managers should provide assurances of service, good delivery, and the success of your product. Keep these men informed of competitor's activities. Show them how your product can help make them be heroes in the eyes of their bosses and associates.

One final thought:

The more competition your product has, the more your product tends to be like that of some other manufacturer . . . then the more your customers and prospects in metalworking will tend to buy the emotional "sizzle" as well as the steak.

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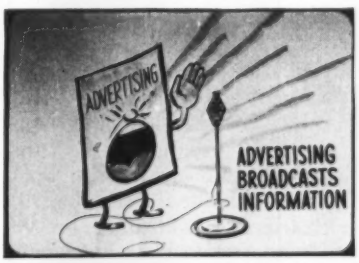
THREE THINGS ADVERTISING DOES BEST . . .



1. Broadcasts information over more ground, faster than a salesman can do it

2. Widens markets, attracts leads, convinces parties with indirect sales influence

3. Builds corporate identity for company that's back of the product

Kefauver Pushes Bill To Allow Consumer Post on Cabinet

YOU AND YOUR wife will soon be sitting in (by proxy) on the deliberations of the President's cabinet if Sen. Estes Kefauver (D., Tenn.) gets his way. The bill creating such a post is sponsored by the coonskin campaigner and 13 other Democratic senators. It can be expected to receive considerable support in the House. In essence, it is what consumer pressure groups have wanted for years. The depression of the thirties spawned organizations and similar legislation to protect the consumer.

As a metalworking manager, you may well have second thoughts about Senator Kefauver's idea. The new department he proposes is designed "to protect and promote the interests of the people of the U. S. as consumers of goods and services," will present "the viewpoint" of the consumer when government policies are formed; represent "the economic interests" of consumers before the court; and disseminate "information helpful" to consumers.

The bill's language is of the broadest sort. It practically bestows the right to interfere in every conceivable function of government. Can you think of anything that doesn't in one way or another concern the consumer? For example, the new department's jurisdiction would extend to the Food & Drug Administration, the Labor Department's price and cost of living divisions, some branches of the Agriculture Department, and some testing functions of the National Bureau of Standards. It could easily become Washington's biggest empire by moving in on the Federal Trade Commission, the Commerce Department, and even the Office of Civil & Defense Mobilization.

More Surveys: More Interference

Studies, surveys, and investigations would be the tools of the department for controlling the relations of business with the consumer. It would have the power to investigate capacity of consumer goods industries, distribution systems, price levels (and their "reasonableness"), and the quality of goods. By legal legerdemain, the restrictions that normally apply to the production of drugs and medicines would be carried over to your wife's new automatic toaster.

Firms with assets of $5 million or more would get special attention from the senator's proposed department: They would be required to exhibit production and distribution costs (although the bill adds that such information would be made public "only in a form" which would disguise the particular company studied).

One prominent business analyst has termed the bill a "Frankenstein." We must recognize that the senator wouldn't agree. He undoubtedly thinks it will benefit the economy and the consumer.

Controls Trend Picks Up Steam

Business can take Senator Kefauver's ideas and those of the Clark-Reuss Bill on price increase notification as strong indications of the power of the liberals in Congress. None of these bills may pass this session or next, but more like them are bound to be popped into the legislative hopper in the early sixties. Without knowing it, proponents of the measures probably deny the basic tenet of capitalism: The bills seem to take free choice out of our economic structure. The Clark-Reuss Bill, for example, would require the President to establish "targets" for employment, production, and purchasing power. This, notes the U. S. Chamber of Commerce, would establish arbitrary patterns into which the government would be required to force the economy.

Fallon Plans for 1962's Roads

Rep. George Fallon (D., Md.) chairman, House Roads Subcommittee, is working fast to keep the federal highway program on schedule. His bill would apportion 1962's federal highway funds on the basis of the 1958 cost estimate (which was also used for 1960 and 1961 apportionments). It would allow for an increase of $300 million in federal funds for the 1962 program. The action would bring 1962's fund up to the levels Congress wants spent in each of the two previous years, 1960 and 1961.

Representative Fallon reports the apportionment must be established now to give state highway departments planning flexibility. Leadtime on a road runs over two years from the engineering stage. The shortage of cash in the Highway Trust Fund will have to be met by a special revenue bill. Highway interests think passage of the Fallon measure on apportionments will lead to a revenue bill this session.

Push for Limited War Capability

Testimony given to the House Defense Appropriations Subcommittee reveals dissatisfaction by the Army and Navy over our huge stockpiles of hydrogen weapons. We could destroy an enemy several times (if that were possible) with what we already have in stock, and the stocks are still being built. It's said that the subcommittee was much impressed with the arguments of the two services for increasing our limited war capability and allowing a dropoff in large expenditures for bomb stockpiles.

CINCINNATI

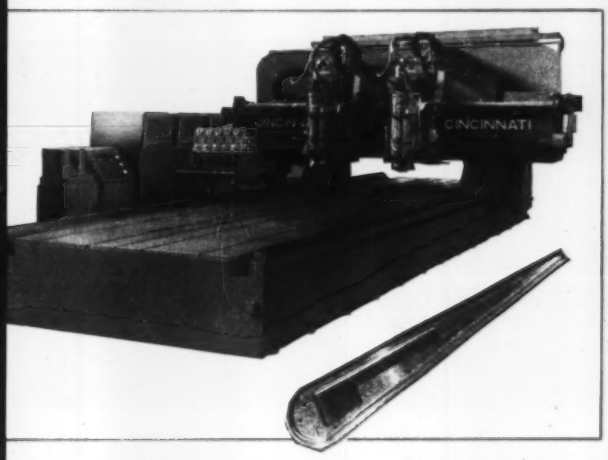
combines modern ideas with over 45 years' experience in designing and building special machinery

Cincinnati Milling's Special Machine Division has the broad experience and engineering talent to design and build special machinery and process equipment of any size and complexity. Highly successful installations are found in metalworking, paper, chemical, optical and many other industries.

Make Cincinnati your first choice for equipment of this type. The Special Machine Division is ready to serve you.

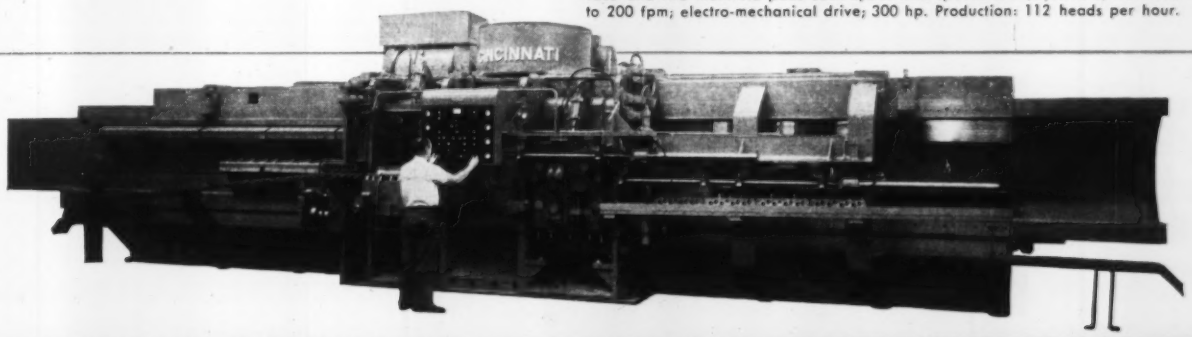
SPECIAL MACHINE DIVISION
The Cincinnati Milling Machine Co., Cincinnati 9, Ohio

CINCINNATI 26-Station Unit Type Transfer Line. This efficient production line automatically mills, drills and bores transmission cases in 33 operations; inserts two bushings; banks excess parts; transfers the castings from one station to the next. Features include unit construction; one station for future engineering changes; complete static electrical control. Accuracy and finish obtained are excellent. The line cycles at the rate of 137 per hour.



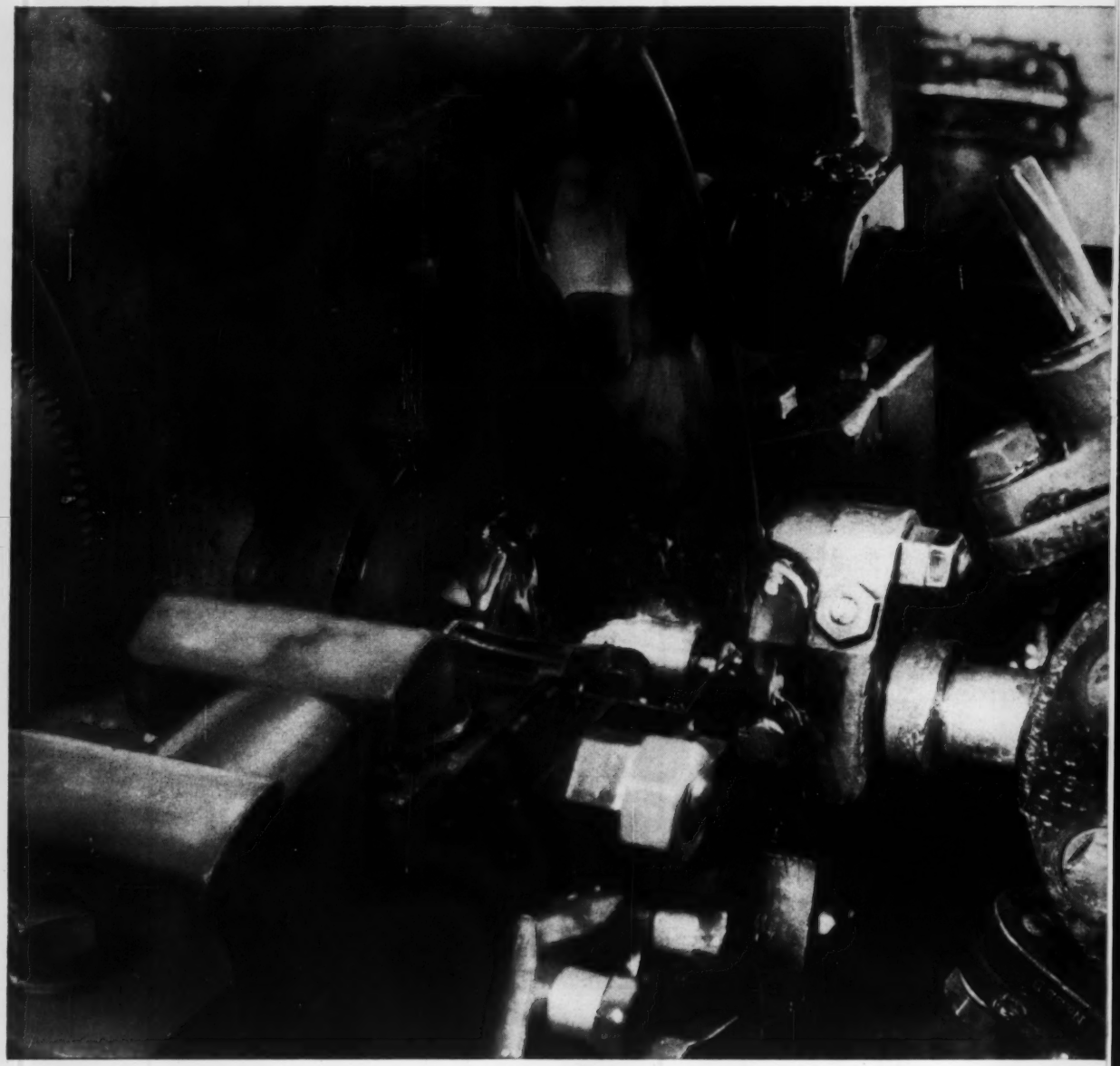
Large Numerically Controlled Milling Machine, developed and built by the Special Machine Division to mill aluminum aircraft components. Many parts of this type, one of which is illustrated, are milled in 1/5 the time usually required. The machine is a gantry type, having fixed table measuring 8 ft. x 30 ft.

Below: **CINCINNATI Horizontal Hydro-Broach Machine,** typical of the many designed and built for the automotive industry to broach cylinder heads and blocks. The machine illustrated broaches cylinder heads on the top, joint face and two manifold pads each cycle. Ram speeds are adjustable, from 100 to 200 fpm; electro-mechanical drive; 300 hp. Production: 112 heads per hour.



SPECIAL MACHINES • VERTICAL AND HORIZONTAL BROACHING MACHINES • COMPLETE PRODUCTION LINES

CINCINNATI



Gold Micrometer winner describes Gulfcut 45B as "the

GULF MAKES THINGS

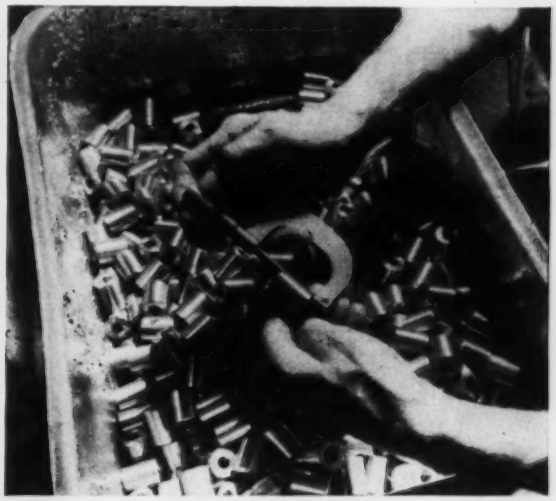
In 1954, the National Screw Machine Products Association awarded the Gold Micrometer to Mr. Emil Johnson, for 40 years of distinguished service to the industry. Mr. Johnson is Vice-President and Superintendent of Connecticut Manufacturing Company, in Waterbury, Connecticut.

Now, with over 44 years of experience with screw machines and cutting oils, Mr. Johnson describes Gulfcut 45B as "the best cutting oil we have ever used for those tough jobs."

Connecticut Manufacturing produces precision parts in all metals for the automotive, electrical, firearms, and toy industries. They have a well-balanced shop equipped with automatic screw machines, cold headers, slotters, knurlers and thread rollers.

To prove his point on the superiority of Gulfcut 45B, Mr. Johnson selected a job in the shop involving the machining of a flush rod, part of a valve assembly made by a well-known plumbing company.

"On this job," he said, "the customer specified heavy



Precision production of these valve assembly flush rods, at Connecticut Manufacturing Company, rolls in high gear with Gulfcut 45B as the coolant-lubricant. Piece is machined from ¼-inch stock of tough monel metal.

Mr. Emil Johnson, left, winner of Gold Micrometer award, shows finished pieces to Peter Eaton, Gulf Sales Engineer. Mr. Johnson uses Gulfcut 45B for all the tough machining jobs at Connecticut Manufacturing Company.

best cutting oil for the tough jobs"...

RUN BETTER!

draft and strain-tempered monel metal. Monel is tougher to cut than most metals. But with a workhorse cutting oil like Gulfcut 45B, we can hold to extremely close tolerances, provide good finish, and do it at higher speeds with less friction. We use Gulfcut 45B on all our tough jobs."

See how Gulf makes things run better. Whatever type of machining you do, there's a shop-tested Gulfcut cutting oil to meet your needs. Call a Gulf Sales Engineer at your nearest Gulf office, or mail the coupon.

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Send me more information on:
- ☐ Gulfcut "Regular" Cutting Oils.
- ☐ Gulfcut Heavy Duty Soluble Oils.

Name _____
Title _____
Company _____
Address _____
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SM-0105

Rolling Mill in Trouble Revitalizes Eight Ways

- **It implemented results of consultant's study.**
- **Strengthened its sales department.**
- **Organized a market research section.**
- **Rebuilt its distributor organization.**
- **Established closer cost and quality controls.**
- **Concentrated on nonferrous mainstays.**
- **Diversified its product lines.**
- **Bought capital equipment worth nearly $1 million.**

SEYMOUR Mfg. Co., Seymour, Conn., has worked itself out of a profitless crisis in 2½ years.

The situation: Seymour's rolling mill was swamped during floods along the Naugatuck River in 1955. Many customers were lost and not all were rewon after the mill resumed operations. Stainless steel had carved inroads in the company's mainstay—the nickel silver market.

• **The Beginning** — The company started its comeback when George T. Hubbell was elected president in October, 1957. His long experience with the 80 year old company enabled him to draw up a program that ended losses and rebuild Seymour to a strong position in the brass, nickel silver, and phosphor bronze markets. The first step: A consultant's study of management, sales, and production techniques.

• **Internal Changes**—The sales department was bolstered in February of last year with planning, better direction, forecasts, budgets, and quotas . . . In May, 1958, a marketing research section was organized. The program: Evaluation of salaries, bonuses, and quotas in sales; institution of a quarterly sales forecasting system; placement of additional salesmen to increase shares of the markets; and changing territories to improve contacts . . . A detailed study of competitive and company distributors was undertaken to stimulate service sales. Also studied: Distributor replacement; additions of others in new markets; and more sales and merchandising help to distributors.

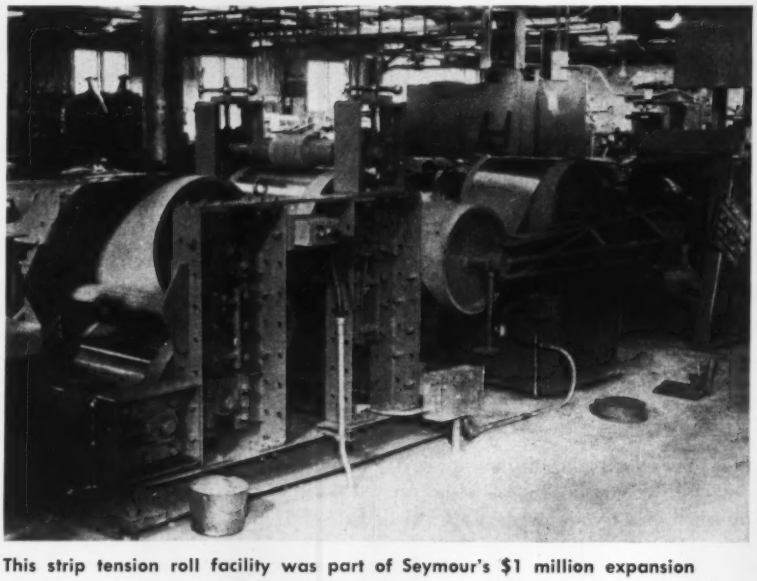
• **Marketing Efforts** — Immediate attention was given to re-establish Seymour in a sound position in nickel silver and phospor bronze markets. The tools: Extensive contact with customers (concentrating on those industries which were weak) and focusing on sales where market penetration was shallow.

Seymour had built an enviable reputation as a quality mill. To improve its product, a major quality control program was launched. New equipment was added to the laboratory, including a $40,000 Jerrell-Hashe direct reader.

• **Move to Diversify** — It was then learned that ultimate markets were limited for nickel silver and phosphor bronze and that other products offered only a modest rate of growth. The decision: Diversify.

Initially, Seymour expanded its product lines to get larger shares of cupro-nickel and 444 bronze markets. Demands for specialty tolerance metals in electrical equipment and other industries prompted it to obtain a United, 4 high, special package mill that would produce material down to 0.001 gage in widths up to 7 in.

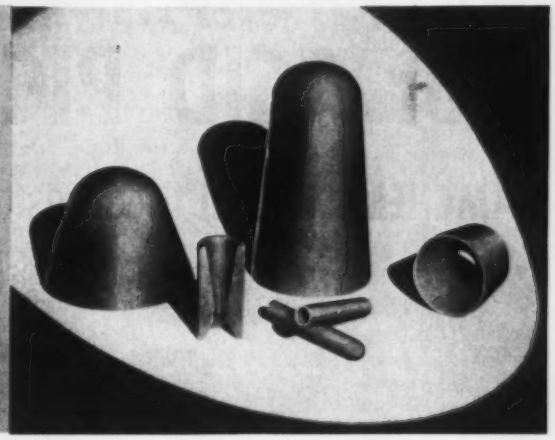
In February this year, the firm began cold rolling stainless steel alloys in thin, close tolerance strip. A new annealing furnace (cost $200,000) was installed. In all, it has spent nearly $1 million on new equipment.



This strip tension roll facility was part of Seymour's $1 million expansion

Look Where Silicon Carbide Is Going

The well established abrasive is getting attention in structural and other uses. One version (particles of graphite are embedded in a matrix of silicon carbide) illustrates its new found versatility. The material, called GRB, can be fabricated into practically any shape (see photo).



WHEN the late Edward G. Acheson first made silicon carbide in an electric furnace fashioned from a plumber's bowl, he probably didn't realize that one day the material would be used in probing outer space. But recent tests show that a form of silicon carbide may fill the requirements of parts for nose cones and rocket nozzles.

• **It May Help You**—That's only one of many areas in which the 70-year-old material (called SiC) shows promise of gaining new significance. Long used as an abrasive, it's now being investigated as a structural material in a variety of high (and low) temperature applications.

• **It Works Here** — Carborundum Co., Niagara Falls, N. Y., has developed several new forms that promise to widen the material's scope. One is called GRB silicon carbide.

Particles of graphite are embedded in a matrix of SiC. The dense, self-bonded matrix shields the graphite to prevent rapid oxidation and erosion. The graphite particles absorb high thermal shock, preventing stress failure. Net result: A rugged new material that combines strength and high thermal shock resistance with the ability to withstand oxidation and erosion at high temperatures and speeds.

• **And Here**—The electronics industry is a growing market for SiC. High temperature, high energy resistors are being made from recrystallized SiC. (Large SiC crystals are bonded by bridges of SiC, forming a continuous, homogeneous structure.)

High temperature thermistors may offer the greatest potential for the recrystallized product. Carborundum suggests its use in: 1. Domestic and industrial ovens. 2. Portable temperature indicating instruments. 3. Jet engine temperature indicating instruments. 4. Soldering irons. 5. Domestic irons. 6. Clothes dryers. 7. Induction heating devices. 8. Industrial fire detection systems.

• **Here, Too**—Colorless, high purity SiC is showing promise as a transistor material for missiles and high speed aircraft. It's available in laboratory quantities at about $200 a pound.

Westinghouse Electric Corp. has developed silicon carbide rectifiers that can operate above 930° F.

• **New Variety**—KT silicon carbide, a new Carborundum impermeable ceramic, is finding many jobs in metalworking. Examples: Heat exchanger parts, combustion tubes, ball mill liners, pipe and fittings, valves for corrosive liquids and high temperature gases, dies for powdered metallurgy, wear resistant parts (orifices, liners, sleeves), nuclear reactor structural parts, rocket nozzles.

• **Electrical Uses**—Reports Carborundum: "On the horizon are appearing important new electrical uses: Rectifiers able to operate at red heat and perhaps even high temperature transistors. Thermocouples, stable to 3990° F, have been produced."

The Air Force's Cambridge Research Center will hold a conference this month to investigate silicon carbide's electrical potential from a defense standpoint.

• **Heat Resistance**—SiC stands high on any list of superrefractory materials. Even the 5000° F inferno in the combustion chamber of a rocket is harnessed by thrust nozzles of SiC. Reasons: High heat conductivity, plus low thermal expansion.

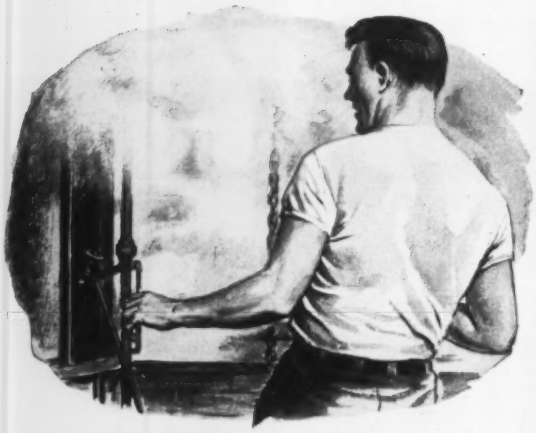
• **Jewelry** — Carborundum is attempting to grow large crystals of high purity SiC. If it succeeds, watch for the material to appear in jewelry as well as new electrical applications.

• **Metallurgical Uses** — Gray iron foundries add SiC briquets to get better machinability and sounder castings.

Steel and ferroalloy producers use the material as a reducing agent and deoxidizer.

new, cost-reducing chemical for ACID PICKLING BATHS

AMCHEM SERSEAL* reduces heating requirements up to 70%, improves working conditions!



BEFORE SERSEAL, steam vapors and fumes escape from the bath, making working conditions unpleasant, lowering morale.

SERSEAL HAS BLANKETED THE BATH in just 10 seconds. All steam, corrosive fumes and vapors are contained within bath.

Put these 7 important Serseal advantages to work for you!...

1 Save up to 70% in heating costs.

2 Improve working conditions both from a comfort and health standpoint. Steam, heat, fumes and vapors are contained within the bath.

3 Cut warmup time. The blanket prevents heat loss.

4 Less corrosion of surrounding equipment. Corrosive fumes are retained in the bath.

5 Reduce the cost for heating elements.

6 Less exhaust equipment required. Since the bath is sealed, there is little escape of fumes and vapors. And in many cases, ventilating systems can be safely eliminated.

7 Now proving its economy, efficiency and overall satisfaction in many customer plants.

Write today for complete information about this important new cost-reducing, work-saving chemical blanket for acid pickling baths! Address Ambler 50, Pa.

AMCHEM

*Patent applied for **SERSEAL**

Amchem Serseal is another chemical development of **Amchem Products, Inc.** (Formerly American Chemical Paint Co.) AMBLER 27, PA. • Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont. • Amchem is a registered trademark of Amchem Products, Inc.

Will Auto Buying Patterns Change?

Detroit wonders if three year cycle for big cars or five year one for imported makes will be followed after it gets its own light models on the market

TYPICAL of the buyer of a U. S. built car is the fellow who trades in his three year old clunker for a spanking new hardtop and signs up for another 36 months of payments. He berates the companies for pricing cars over his head, and curses the high cost of maintenance and repair. But every three years—or oftener—he's back in the market.

R. L. Polk Co. figures show that roughly 35 per cent of big car trade-ins are three years old. Only 13 per cent are four years or older.

The typical buyer of an imported car stands out in sharp contrast. The National Automobile Dealers Association, which has been surveying this bird ever since it was discovered the market for U. S. cars has been dropping, finds that 34 per cent of trade-ins for foreign makes are five years old. The other 66 per cent is divided almost equally among autos one to four years old.

• **Question**—Now Detroit is wondering which pattern buyers will follow when they have a chance to acquire the U. S. built light cars the Big Three are readying. A popular theory is that if buyers keep compact cars five years, it will depress the normal rate of market expansion. There's a complicated formula that goes with this, but the conclusion is that the longer lived economy cars could stall 250,000 potential new car buyers each year.

The table (right) shows some of the NADA's latest findings. Presumably, these statistics also apply to Rambler and Studebaker Lark buyers. "Most of the sales are for cars costing less than $1900," points out Paul Herzog, NADA's research director. His surveys show that 60 per cent of the buyers of foreign makes traded in low priced American cars. Some 25 per cent traded one import for another. Over half the sales were for one-car family use.

Backing up George Romney's pitch that the car is no longer a prestige symbol, Mr. Herzog reports that 95 per cent of the foreign car owners cite price and economy of operation as their prime reasons for buying.

This array of facts and figures only substantiates what Detroit has suspected for over a year. The talk it has generated is the kind that's always cropping up when Detroit faces a change. In private conversations, several industry officials have admitted that while they aren't sure what will happen to the forthcoming light cars, they believe that no matter what reasons are given, purchasers will continue to buy the smaller cars pretty much the same way they've been buying bigger ones.

• **Answers** — Says one executive: "It's most unlikely that the majority of these economy car buyers will keep their products five years instead of three. Remember that the five year old cars these import buyers have traded in are mostly American automobiles. All this seems to prove is that these people would keep any car five years."

If the compact car market doesn't rise above 1 million units a year, the industry isn't going to worry too much about how long these cars are kept. But Detroit no longer is quite so complacent about Mr. Romney's prediction that compact cars will account for 50 per cent of annual sales. If the mar-

Price Preferences of Foreign Car Buyers

Their occupations	Under $1500	$1500-1899	$1900-2499	Over $2500
Professional	35%	38%	34%	39%
Executive	18	20	22	31
Skilled	15	15	15	10
Sales	10	11	12	10
Clerical	8	8	9	4
Students, housewives, etc.	14	8	8	6

Source: National Automobile Dealers Association survey.

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ket does continue to grow you can bet that these smaller cars will undergo enough changes every three years or so to prod buyers into making a switch.

In fact, there's a fair sized segment of autodom that believes that as the compact car market begins to expand so will the compact cars. In another five or six years, it's likely that a car starting out with a 106 in. wheelbase will be stretched to 112 in. By 1975, we'll be ready to go through the whole "small car" cycle again.

Meanwhile, the biggest persuader for keeping buying patterns the same is dealer financing practices. As one GM marketeer puts it: "I don't know why, but it seems like the greatest compulsion for buying a new car is to pay the 36th installment on the old one. After three months of freedom from monthly payments, it seems like the average guy just can't wait to jump back into hock. I don't think it makes much difference what kind of car he drives." The industry obviously isn't going to do much to disturb this tendency.

Hawaiian Market Hailed

Chrysler Corp. has taken time from searching out foreign markets to laud our newest state, Hawaii, as a fast growing automobile market. Nicholas Kelley Jr., Chrysler vice president and manager of the Overseas Div., says Hawaii has 170,000 passenger cars in operation. This number has almost doubled in the last ten years while the number of cars on the mainland has increased only by two thirds, he adds.

Hawaii ranks 45th among the states in passenger car registrations. Delaware, Wyoming, Vermont, and Nevada have fewer cars. Alaska's total isn't known, but it's believed to be much lower if military vehicles are excluded. The District of Columbia has 175,338 cars registered.

Travel in Hawaii is somewhat restricted since the largest island is less than 100 mi. wide. As a result, Mr. Kelley points out that over a third of 12,000 new cars registered in the islands last year are small imports from Europe and Japan. He believes this will be a golden market for Simca whose Hawaiian sales doubled between 1957 and 1958.

Chevy Move May Be Tipoff

Chevrolet Div. is adding 79,000 sq ft to the truck assembly area of its 1 million sq ft divisional assembly plant at Flint, Mich. Division officials had "no comment" when asked whether Chevrolet would discontinue building trucks at its Willow Run, Mich., plant.

Thomas M. Schooley, Flint plant manager, says the continuing trend toward custom assembly has made it necessary to provide more storage space for parts and subassemblies as well as more elbowroom for putting trucks together. Autodom believes Willow Run truck production will be moved to Flint because the Willow Run facilities are the buildup site for Chevrolet's light car.

The expansion and modernization program in Flint calls for new paint spray booths and drying ovens as well as rearrangement of spring, axle, and chassis lines. The additions will be completed by mid-July and equipment installations will be finished by September. Chevrolet hasn't released cost figures, but the job is estimated to run about $948,000.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,112
2 Mo. Totals	1,024,241	881,627
March		357,049
April		316,503
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,920
Total		4,243,526

Week Ended	1959	1958
Feb. 28	127,783	91,508
Mar. 7	133,540	83,892
Mar. 14	134,283	86,447
Mar. 21	135,466	80,560
Mar. 28	119,881†	93,844
Apr. 4	125,000*	64,318

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

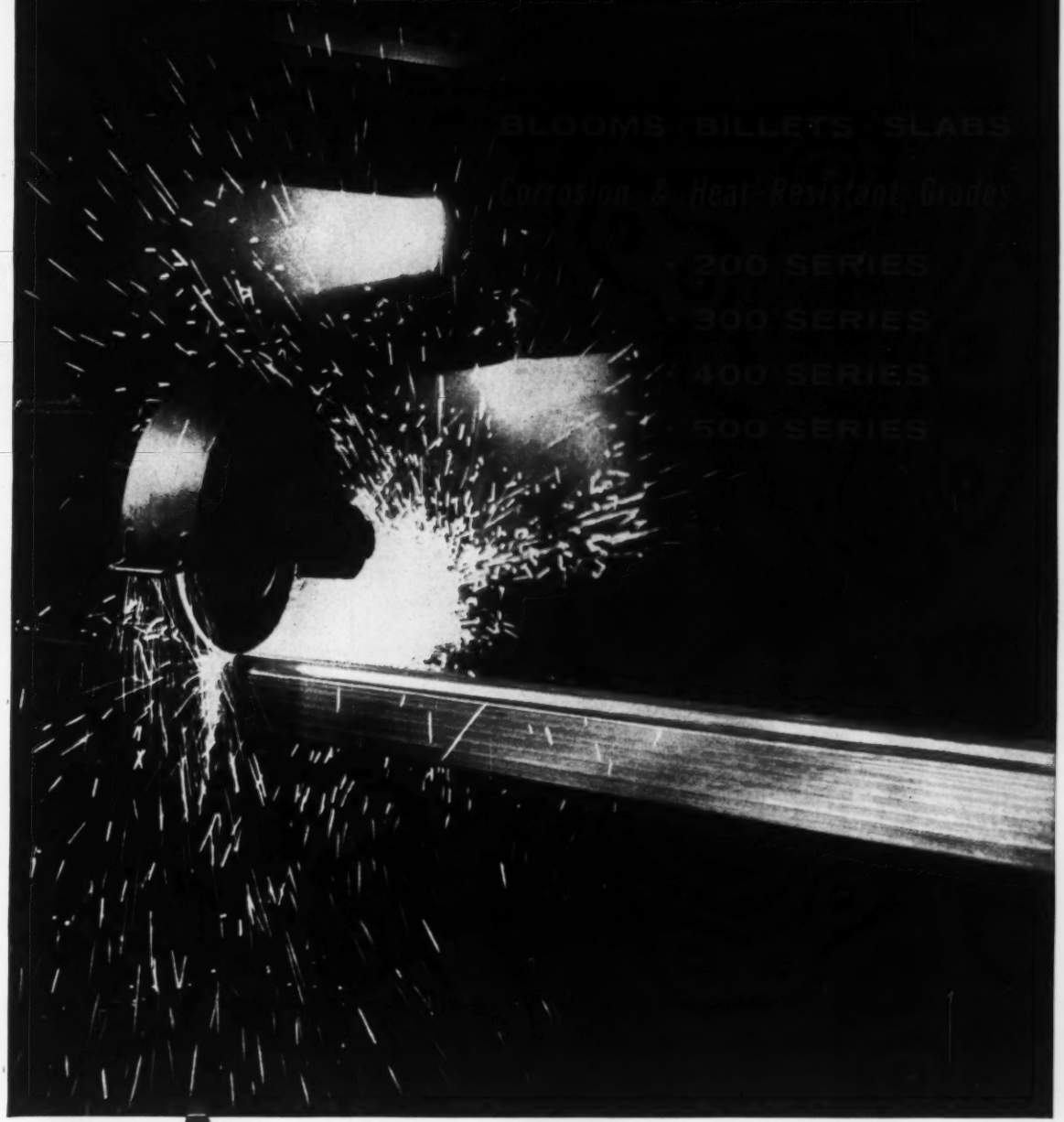
- We don't believe it, but Detroit's rumor circuit has it that Chevrolet's light car will be named *Invader* and Chrysler's entry is called *Falcon.*
- Most conservative estimates now peg total 1959 small car sales at 850,000; possibly 950,000. This includes the imports plus Ramblers and Larks.
- Ford sales continue to climb. Early March sales are running 10 per cent above February's and 18 per cent above January's. For the first ten days of March, sales were 58 per cent above last year's. Chevrolet Div. no longer is releasing ten-day figures. This usually indicates a sales decline.
- Roy Abernethy, AMC's marketing vice president, reports that 127,216 Ramblers have been sold so far in the fiscal year, compared with 51,829 cars for the same period last year. AMC also announces that new steering linkage ball joints with nylon bushings which are permanently lubricated and sealed for life, will be installed on Rambler Rebel V-8 models as a running change this spring. They'll be standard on all 1960 Ramblers.
- Chrysler's De Soto Div. is investing nearly $25 million in engineering and styling models through 1963. J. B. Wagstaff, De Soto's general manager, says styling and engineering commitments have been made on 1960 and '61 models. Development work is underway on the '62s, and the 1963 cars are on the drawing boards.
- More than 20 makes of British cars will be displayed at New York's International Auto Show, Apr. 4-12. Included are a new V-8 sports car designed for the American market, a new economy car that can be assembled from a "do-it-yourself" kit, and a four seater sports coupe claimed to be the world's fastest production car.

Holland's new DAF car, priced under $1500, will also be featured. Powered by a 2 cylinder engine, the car delivers more than 40 mpg. Top speed is about 60 mph. An automatic transmission is optional.

- A unitized glass fiber hood, fender, and radiator shell assembly gives conventional heavy duty trucks tilt cab-over-engine accessibility. Known as Uniglas, it is made by Kenworth Motor Truck Co., Seattle.

ARISTOLOY STEELS

STAINLESS STEEL



BLOOMS • BILLETS • SLABS

Corrosion & Heat Resistant Grades

• 200 SERIES
• 300 SERIES
• 400 SERIES
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ARISTOLOY STEELS

COPPERWELD STEEL COMPANY • Aristoloy Steel Division

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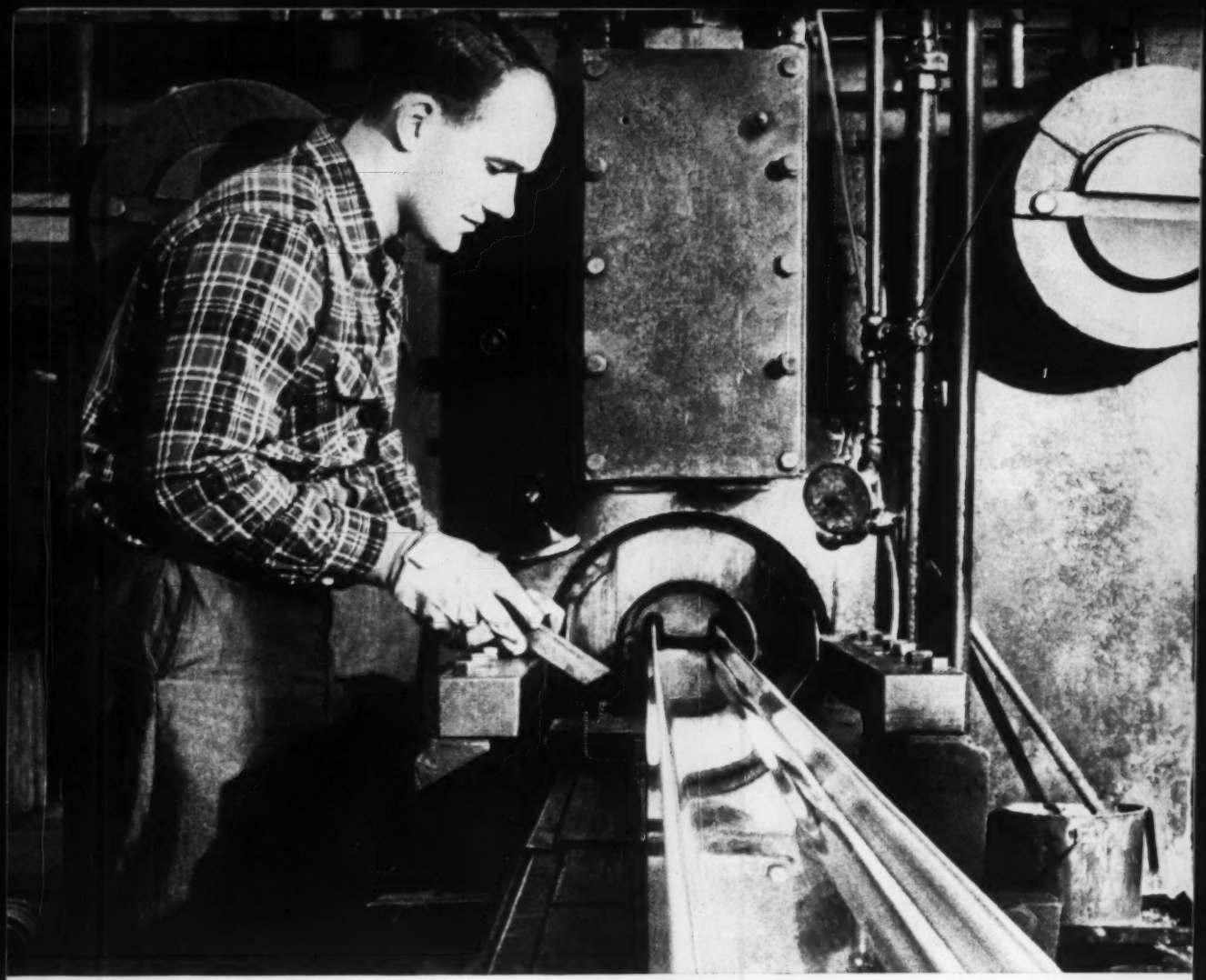


An improved version of the magnesium silicide alloys, new ALCAN B51S is substantially more economical to extrude than AA-6061.

From Aluminium research...

A new kind of extrusion alloy

New ALCAN B51S aluminum alloy... extrudes more economically than its alloy equivalents... offers important new market opportunities for your extruded products.

Newest of Aluminium Limited's research developments, ALCAN B51S offers many advantages to aluminum extruders now working with AA-6061 (ALCAN 65S).

The immediate advantages of this new alloy are realized in the shop—in economy of extrusion and in the quality of the as-extruded finish. For ALCAN B51S extrudes substantially faster than AA-6061 (ALCAN 65S) with less pick-up and fewer die lines. Both advantages are particularly evident in porthole extrusions.

To the independent fabricator, the new alloy also offers increased market opportunities. Its greater strength will be valuable in many areas of aluminum application: including railings, decking, lighting standards and brackets; electrical substations and structural members of road vehicles—each and every one a new mass-tonnage opportunity for the aluminum fabricator.

For technical information on new ALCAN B51S, or for specific assistance on any ingot problem, call or write the nearest office of Aluminium Limited Sales, Inc.

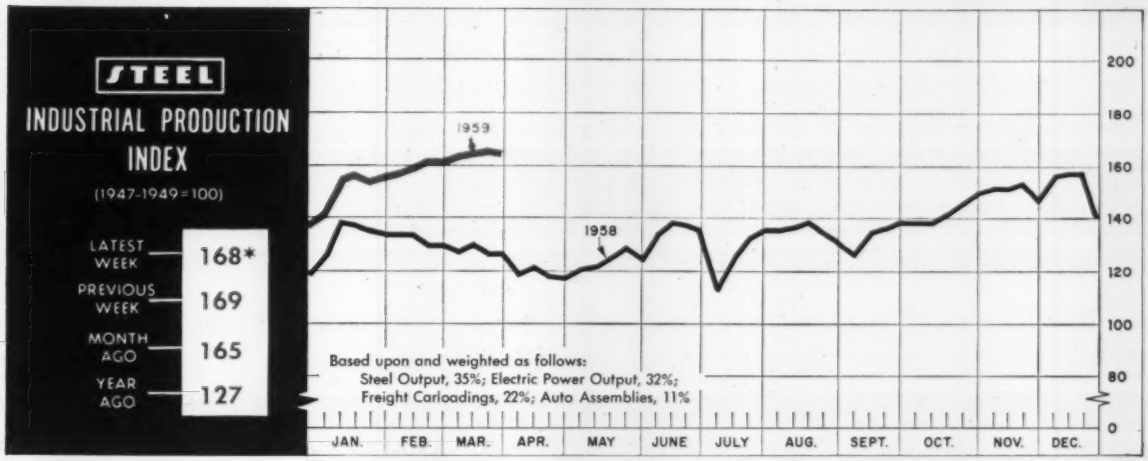
Aluminium Limited

Ingot Specialist...serving American Aluminum Fabricators—

In the U.S. — Aluminium Limited Sales, Inc.
630 Fifth Avenue, New York 20, N.Y.

Cleveland • Chicago • Los Angeles • Detroit • Atlanta

Additional distribution (Alcan Foundry Alloys):
Apex Smelting Co., Chicago, Cleveland, Los Angeles
Charles Batchelder Company, Inc., Botsford, Conn.



*Week ended Mar. 8.

Leading Indicators Show Stability

THE ZIP that characterized the early stages of the recovery has about played out. Six of the eight so called "leading" business indicators set forth by the National Bureau of Economic Research indicate that the economy is in the process of leveling out.

The eight barometers historically show the movement of the general economy anywhere from 2.5 to 10.5 months ahead. All but industrial construction have been in an upward movement long enough to indicate that the peak in the present business uptrend probably has been reached and that a plateau at a near record height will prevail at least until the steel labor settlement is reached. None of the indicators foreshadows even a slight downtrend in the foreseeable future.

• **Business Failures** — (Leadtime: 10.5 months.) The number of business failures has been declining steadily since last April. So far this year, the weekly average is 289, compared with 317 for the corresponding 1958 period, says Dun & Bradstreet Inc. Liabilities do not give as clear a picture of betterment, but February's total was a decided improvement over the January figure. Casualties have been heavier than usual in the last few months in the larger corporations. Generally speaking, however, liabilities have been decreasing since May, 1958.

• **Business Incorporations** — (Leadtime: 2.5 months.) Since last March, D&B's figures show incorporations have been increasing steadily, with the biggest hikes coming since November. Though down numerically in short February, the 15,758 new charters set a record for that month. Combined with January's 18,765, the two month total climbed 46.6 per cent above the corresponding 1958 total and 42.8 per cent ahead of 1957's.

• **Stock Average**—(Leadtime: six

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,653[1]	2,631	1,312
Electric Power Distributed (million kw-hr)	12,850[1]	12,900	11,645
Bituminous Coal Output (1,000 tons)	7,700[1]	7,625	7,596
Crude Oil Production (daily avg—1,000 bbl)	7,150[1]	7,203	6,264
Construction Volume (*ENR*—millions)	$355.4	$393.7	$441.2
Auto, Truck Output, U. S., Canada (*Ward's*)	152,991[1]	171,093	120,468
TRADE			
Freight Carloadings (1,000 Cars)	610[1]	603	532
Business Failures (Dun & Bradstreet)	292	311	357
Currency in Circulation (millions)[3]	$31,231	$31,287	$30,524
Dept. Store Sales (changes from year ago)[3]	+17%	+9%	−4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$24,903	$26,589	$22,359
Federal Gross Debt (billions)	$284.2	$284.5	$273.0
Bond Volume, NYSE (millions)	$22.8	$36.6	$21.6
Stocks Sales, NYSE (thousands of shares)	12,877	21,613	10,856
Loans and Investments (billions)[4]	$94.7	$94.3	$90.5
U. S. Govt. Obligations Held (billions)[4]	$30.3	$30.6	$28.3
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	220.8	220.9	199.1
All Commodities[7]	119.3	119.4	119.8
Commodities Other than Farm & Foods[7]	127.8	127.8	125.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

ADAMS FACT FILE #2

PLANT AIR

Moisture Chief Cause of Trouble . . .

Every company today is looking for ways to offset the increased costs of labor, material, equipment and services. At a gasoline station you expect "Free Air", but in industry it is a major expense. Perhaps in your own plant, for an investment in a few minor compressed air system alterations, significant savings are possible.

Water, sludge, rust, oil and dirt in compressed air systems are prime causes of maintenance and production down-time. Water vapor condensing in air lines tends to corrode the piping. Also, water present in the piping may freeze during winter, causing serious reduction of compressed air supply. Such restrictions are often difficult to locate and thaw. This same line moisture may emulsify lube oil destroying its lubricating value and the resultant mixture has high fouling characteristics. Frequently, ice will form within the tool itself since expanding air cools the moisture . . . tool efficiency will be seriously affected.

Some of the Other Problems Created By Wet Compressed Air . . .

Wet compressed air is not only a construction and production tool problem. Faulty paint jobs, contaminated chemical and food products can often be traced to moisture laden compressed air. Waterhammer, unequal pipeline thermal expansion and line leaks also result from collected moisture. In addition, air lost through traps, and in blow-down of compressed air lines provide no useful work . . . represent a sizeable power loss.

You Can Lick Compressed Air Moisture Problem . . .

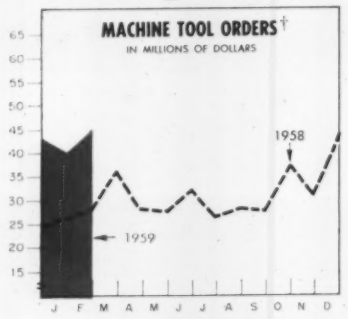
All of these hidden costs can be virtually eliminated by the installation of an Adams Aftercooler and Cyclone Separator between the compressor and receiver tank. By cooling discharge air to within 10° F. of cooling water temperature — guaranteed with Adams standard Aftercoolers — the moisture can be removed at the separator. Pressure loss is less than one-half pound on these units including the separator. In severe cases, moisture removal of over 90 per cent can be obtained by cooling the air with Adams 2° Aftercooler to within 2° F. of water temperature.

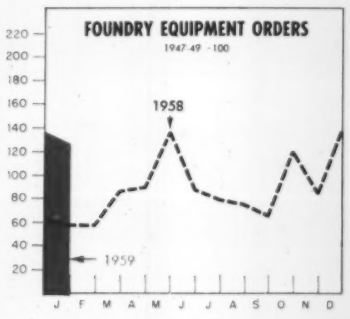
Air Filter for Final Protection at Point of Use . . .

As an added safeguard for expensive tools and equipment, an Adams Poro-Stone Air Filter should be installed just before the air is used. These filters remove all solid material picked up by the air stream. With an Adams Aftercooler, Cyclone Separator and Air Filters clean, dry, trouble-free air is supplied to your production tools. You get continuous service with minimum maintenance.

For further information on how the complete line of Adams air equipment can solve your compressed air problems, write today for your free copy of Bulletin No. 712 on Aftercoolers and Bulletin No. 117 on Poro-Stone Air Filters from the R. P. Adams Company, Inc., 222 East Park Drive, Buffalo 17, New York.

THE BUSINESS TREND





	New Orders 1959	New Orders 1958	Shipments 1959	Shipments 1958
Jan.	41,050	26,850	31,300	57,800
Feb.	45,500*	28,300	36,100*	48,050
Mar.	.....	36,150	.....	54,150
Apr.	.....	28,300	.....	50,900
May	.....	28,050	.....	50,100
June	.....	32,100	.....	45,500
July	.....	26,550	.....	29,700
Aug.	.....	28,300	.....	29,800
Sept.	.....	28,100	.....	34,900
Oct.	.....	37,000	.....	41,400
Nov.	.....	30,700	.....	33,650
Dec.	.....	43,900	.....	43,950
Totals	.....	374,300	.....	519,900

†Metal cutting and metal forming.
*Preliminary.
National Machine Tool Builders' Assn.
Charts copyright, 1959, STEEL.

	1959	1958	1957
Jan.	127.4	57.9	117.9
Feb.	....	57.6	188.4
Mar.	....	85.9	127.0
Apr.	....	88.7	101.1
May	....	136.1	136.2
June	....	87.7	187.5
July	....	77.9	98.6
Aug.	....	74.1	231.3
Sept.	....	64.5	113.9
Oct.	....	118.9	145.3
Nov.	....	83.3	59.6
Dec.	....	137.0	61.4
Avg	....	89.1	130.7

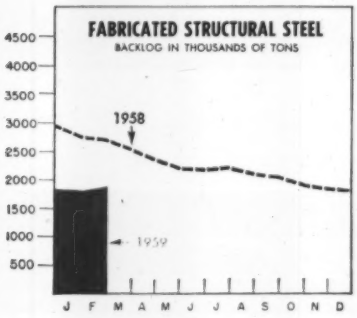
Foundry Equipment Mfrs. Assn.

months.) The Dow-Jones industrial stock price average has been moving up almost continuously since December, 1957. The figure for March is not available, but it will be well above February's $590.72. The average broke the $600 mark for the first time in March and stayed there much of the month. It began to slip off gradually last week, but no drastic decline is anticipated in view of the strong showing of steels, rails, and metalworking generally.

• **Residential Building**—(Leadtime: 6.2 months.) This has been one of the strongest factors in the comeback from the recession. The floor area figure (as measured by F. W. Dodge Corp.) has been moving generally upward since February, 1958. Following the usual seasonal decline in November and December, the January figure began the early year climb. The latest Dodge report shows that "by far the strongest element in February was housing." And the $2.3 billion total was the highest for any February on record.

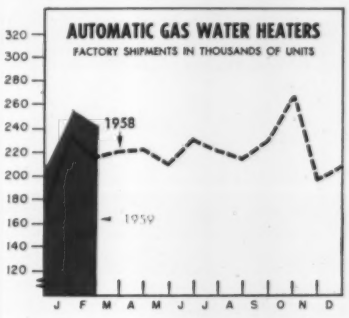
• **Commercial Building** — (Leadtime: 5.2 months.) Of the eight indicators, this is the only one which has failed to show significant improvement. Floor area in January edged up seasonally to a point slightly above the year-ago mark, but it was still considerably below the corresponding 1957 figure. However, Dodge reported for February: "The most encouraging feature of the new figures was the first upturn in industrial building contracts since the recession." Contracts rose 37 per cent ahead of the corresponding 1958 figure, and, presumably, floor area made a corresponding gain.

• **Average Workweek**—(Leadtime: 3.8 months.) Beginning in May, 1958, the average hourly workweek for all manufacturing employees began its ascent from the recession low of 38.3 hours. It hit a 21-month high of 40.2 hours in November and has settled back to 39.8 hours as of February, says the Bureau of Labor Statistics. Because of the abundance of capacity, it is not likely that the workweek will go much higher unless the economy takes on the true characteristics of a boom, or unless a national emergency arises. This factor should probably be considered neutral (at a high level) in any discussion of the business climate.



	Shipments 1959	Shipments 1958	Backlogs 1959	Backlogs 1958
Jan.	224.3	316.7	1,794	2,778
Feb.	216.1	282.6	1,864	2,727
Mar.	....	336.6	....	2,542
Apr.	....	323.6	....	2,387
May	....	328.2	....	2,211
June	....	329.2	....	2,191
July	....	290.8	....	2,220
Aug.	....	298.0	....	2,119
Sept.	....	313.7	....	2,047
Oct.	....	307.1	....	1,913
Nov.	....	271.1	....	1,839
Dec.	....	266.6	....	1,809
Total	....	3,664.2		

American Institute of Steel Construction.



	Shipments—Units 1959	1958	1957
Jan.	254,300*	235,400	214,900
Feb.	242,400*	216,300	208,200
Mar.	.....	221,600	226,600
Apr.	.....	221,900	238,200
May	.....	210 000	233,400
June	.....	231,000	211,700
July	.....	221 400	192,500
Aug.	.....	215,500	210,300
Sept.	.....	230,000	215,500
Oct.	.....	265,900	234,700
Nov.	.....	196,100	173,500
Dec.	.....	207,700	172,800
Totals	.....	2,673,800	2,532,300

*Preliminary.
Gas Appliance Mfrs. Assn.

• **Orders for Durables**—(Leadtime: 6.9 months.) New orders for durable goods are continuing an uptrend that started last May. The only break in the slope came in August. It was partially due to the automotive industry. No further break is expected until midsummer when steel mill orders are expected to fall off.

• **Wholesale Prices**—(Leadtime: 2.6 months.) Although prices remained stable during most of the recession, they climbed from a low of 119 (1947-49 = 100) in October to 119.5 in February, reports the Bureau of Labor Statistics. The index leveled off between January and February and is now 0.2 point below the all-time high of March, 1957.

STEEL's Index Peaks Out

The evidence offered by the eight leading indicators is confirmed by STEEL's industrial production index. Starting from a low point of 118 (1947-49 = 100) in the last week of April, 1958, it has climbed all the way back to set a record of 169 during the week ended Mar. 21. That's 1 point above the previous record, set first in early December, 1956, and equaled in mid-March. The preliminary reading for the latest period (week ended Mar. 28) was back to 168, and it is doubtful that final figures will improve it.

In the immediate future, the plusses will be counterbalanced by the minuses in the structure of our index. Still a potent factor is the steel industry, which set another record last week with a scheduled output of about 2,660,000 net tons for ingots and castings. The previous record was 2,631,000 tons, set in the week ended Mar. 22 and equaled the following week.

But automotive production is beginning to taper off as stocks of new cars in dealers' hands near the 900,000 unit mark. While output will remain well above year-ago levels, it will no longer be the expansive force in the economy it was following the settlement of the glassworkers' strike and the resumption of full production at Chrysler Corp. This factor will negate any advances in steel production as far as the production index is concerned.

For the next few weeks, electric energy production and railroad freight carloading will counterbalance each other. The electric utilities are facing a seasonal downturn, and the railroads are entering a seasonal upturn.

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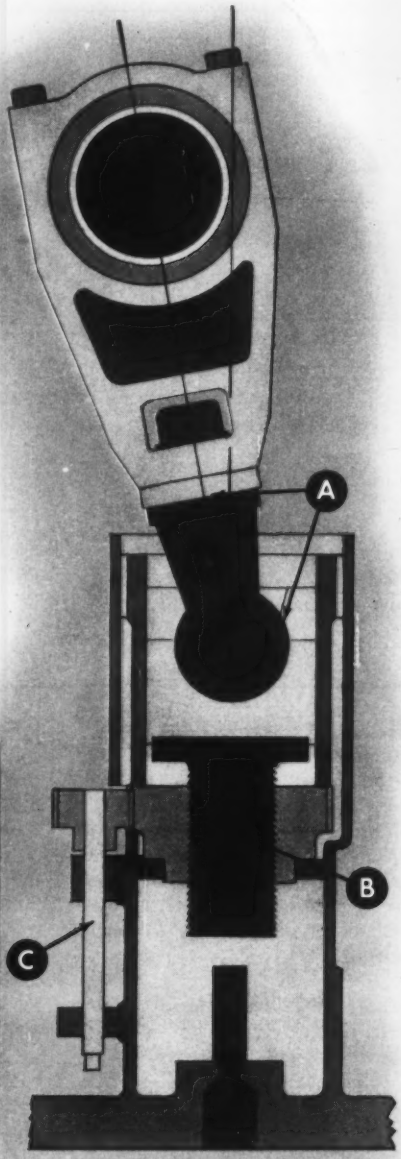
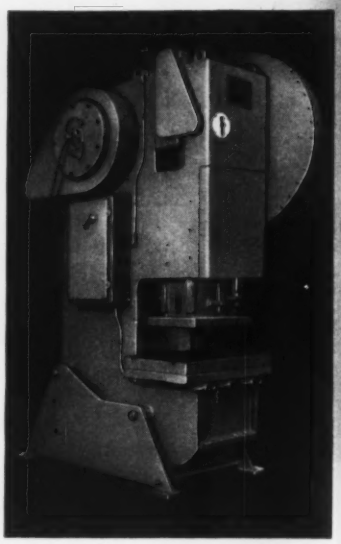
where you need it...

Easy slide adjustment

where you want it...



Oliver-Farquhar design . . . (A) Critical areas are thoroughly supported for maximum strength. (B) Fully guided adjusting screw is held firmly in base. (C) Easy, floor-level adjustment.



The Oliver-Farquhar O. B. I. Mechanical Gap Press has a heavy-duty barrel type pitman connection with the slide adjusting screw fully guided to eliminate side thrust and bending loads on the screw. It withstands the full loads of the press at each stroke and the shocks developed in pressing and stripping. There is no danger of bent screws and cracked or broken pitmans. For faster, easier floor level slide adjustment, a simple, directly connected shaft extends to lower end of slide. No special wrench is required for this manual adjustment.

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Bliss-Press Div. eng.

JOHN R. MORRILL
president of Hubbard & Co.

MONTE LINDMOE
Yuba Consolidated v. p.

WERNER A. REES
DeWalt Div. engineering post

Jack L. Kennedy was named chief sales engineer, Press Div., **E. W. Bliss Co.**, Canton, Ohio. He joined Bliss in 1948 and worked in the Hastings, Mich., and Toledo, Ohio, plants. He has spent the last eight years in the Canton general office as sales engineer. Mr. Kennedy assumes duties formerly held by **Harold B. Morse**, recently retired.

John R. Morrill was elected president, **Hubbard & Co.**, Chicago. He resigned as general manager, Evansville Div., Bendix Westinghouse Automotive Air Brake Co. In his new post, Mr. Morrill succeeds **Charles H. Dyson**, who remains on Hubbard's board of directors.

James T. Workman was made administrative assistant to the president of **Byron Jackson Div.**, Los Angeles, Borg-Warner Corp. He was general superintendent of BJ pump and oilfield products.

George J. Morton was elected president of **Idaho Maryland Mines**. The operating division of Idaho Maryland Mines is Sierra-Schroeder Div., Glendale, Calif., acquired by IMM in 1958 following a consolidation of Schroeder Valve Co. and Sierra Tool Co.

John W. Lyon was appointed vice president - manufacturing, **General Binding Corp.**, Northbrook, Ill.

K. G. Hunt was named superintendent of **Crucible Steel Co.'s** new division of construction and maintenance, Midland, Pa., Works. **H. T. Silverman** was named assistant division superintendent.

Monte Lindmoe, former executive vice president, Southwest Welding & Mfg. Co., was named vice president of **Yuba Consolidated Industries Inc.**, San Francisco, and director of sales for Yuba's operating divisions and subsidiaries.

Richard H. Koehler was appointed general sales manager, **Le Roi Div.**, Westinghouse Air Brake Co., Milwaukee. He succeeds **Jack E. Heuser**, resigned. Mr. Koehler was on the staff of the president of Westinghouse Air Brake, Pittsburgh, and was director of advertising and publicity.

Leslie F. Schurck was made director of industrial engineering, **Cooper Alloy Corp.**, Hillside, N. J. He is responsible for development of wage incentives, plant layout, methods and procedures. Before joining Cooper Alloy, he was with Fairchild Engine Div., Fairchild Aircraft Co., as chief industrial engineer.

Parker-Kalon Div., Clifton, N. J., General American Transportation Corp., named **Louis Lovisek** manufacturing manager; **Harold Rosenberg**, plant manager; **Ed Holmes**, planning manager.

G. R. Whitlow was named manager-export sales, **Hobart Bros. Co.**, Troy, Ohio. He succeeds **W. J. Chaffee**, now director, Statistical Dept.

John A. Houston was made general manager of the Dallas plant of **Joseph T. Ryerson & Son Inc.** to succeed **Fred W. Bush**, resigned.

Werner A. Rees was appointed to the post of quality and standards engineer at **DeWalt Div.**, Lancaster, Pa., American Machine & Foundry Co. He was with General Electric Co.'s Quality Control Dept.

Wesson Co., Detroit, elected three vice presidents, all of whom are district managers: **Sy Dworecki**, Chicago; **James J. Smith Jr.**, East Paterson, N. J.; **Gerald Bogner**, Cleveland.

Stephen B. Elggren (sales manager), and **Terrence M. Nolan** (works manager), were elected assistant vice presidents, Niagara Frontier Div., **Bell Aircraft Corp.**, Buffalo.

T. A. Sandstrom fills the new post of assistant division manager, **Kolcast Industries Div.**, Thompson Ramo Wooldridge Inc., Minerva, Ohio.

John Alico was appointed manager of manufacturing at **Walworth Co.**, New York.

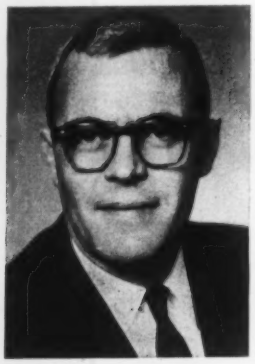
Mesta Machine Co., Pittsburgh, promoted **Edward D. Mesta** to assistant sales manager; **Richard L. McIlavy**, manager of machinery sales; **John M. Edwards**, assistant to the sales manager.

Dr. Herbert R. J. Grosch was made manager, space program, for **International Business Machines Corp.'s** Military Products Div. He is in charge of the Vanguard Center in Washington, and will also maintain liaison with the space laboratory in Owego, N. Y., and the Watson Sci-

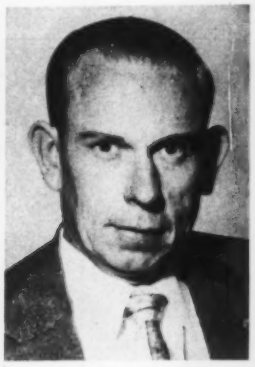
L. S. HAMAKER

S. A. CRABTREE

Republic Steel sales promotions



GORDON N. DOW



R. REX HARTUP

promotions at Leschen Wire Rope

entific Computing Laboratory at Columbia University, New York.

L. S. Hamaker was appointed assistant vice president-sales, **Republic Steel Corp.**, Cleveland. He is succeeded as general sales manager by **S. A. Crabtree**, former assistant general sales manager.

Harold C. Sager was made manager of a new sales organization responsible for the sale of Scate (self-checking automatic test equipment), Electronics Div., **Stromberg-Carlson Div.**, General Dynamics Corp., Rochester, N. Y.

Robert W. Gregory was made Indianapolis branch manager, **Kaiser Aluminum & Chemical Sales Inc.**

R. J. Matteson was made eastern district engineer, Hydraulic Controls Div., **North American Mfg. Co.** He has headquarters in Plainfield, N. J.

Warren Gressle was made assistant to the manager of sales, **American Welding & Mfg. Co.**, Warren, Ohio. He returns to American Welding to fill the newly created post after 18 months with New Jersey Div., Kelsey-Hayes Corp., where he was sales manager.

Ray V. McCadam fills the new post of manager of equipment tube sales for Industrial Tube Div., **Raytheon Mfg. Co.**, Newton, Mass. He was commercial sales representative in Los Angeles.

George C. Stradley joined **Michigan Chemical Corp.**, St. Louis, Mich., as group leader in charge of chemical engineering research.

Gordon N. Dow was named general manager; **R. Rex Hartup**, general sales manager, **Leschen Wire Rope Div.**, St. Louis, H. K. Porter Company Inc. Mr. Dow, who assumes responsibility for operations of the division, was general sales manager. Mr. Hartup was southeast district manager.

Lester K. Murray, manager of the Colorado Springs, Colo., office of **Convair Div.**, General Dynamics Corp., was assigned additional duties as acting manager of Convair's office at Omaha, Nebr. He succeeds the late **Gordon Graff.**

Cecil S. Allen was made director of engineering, Electrical Products Group, **Electric Auto-Lite Co.**, Toledo, Ohio.

Chelsea R. Phillips was made Chicago district sales manager, **Robins Conveyors Div.**, Melrose Park, Ill., Hewitt-Robins Inc. He was sales manager in Hibbing, Minn., for Hewitt-Robins.

Surface Combustion Corp. appointed **Carl W. Sisco** Pittsburgh district sales manager; **Robert M. Snyder**, district manager, Steel Mill Div., Chicago office; **Robert E. Strutner**, sales engineer, Toledo, Ohio, Steel Mill Div.

W. L. Nopper was made New York district sales manager, **Roots-Connersville Blower Div.**, Dresser Industries Inc. **R. G. Nancarrow** was made Philadelphia district sales manager.

Harry C. Levenson was made assistant to the president in charge of manufacturing of the subsidiary companies of **Landers, Frary & Clark**, New Britain, Conn. He was general manager of the firm's Landers of Arkansas Div., Ft. Smith, Ark. This operation is now under supervision of **Charles O. Dahl**, former manufacturing vice president for National Presto Industries, Eau Claire, Wis. Mr. Levenson succeeds **Frederick W. Hornbruch Jr.**, vice president of the company, who resigned.

James R. Sexton was appointed staff supervisor, industrial relations, **Armco Steel Corp.**, Middletown, Ohio. He is succeeded as general office employment adviser by **David Murray.**

Harold Christopher and **Walter J. Case** were made assistant sales managers, New York district, **American Steel & Wire Div.**, U. S. Steel Corp. The production departments of the New York district sales office were consolidated into a single, integrated management unit. Mr. Christopher was sales manager-manufacturers' products. Mr. Case was sales manager, wire rope and construction materials.

Walfrid H. Johnson was made New York district sales manager, **Western Brass**, Metals Div., Olin Mathieson Chemical Corp., Long Island City, N. Y.

Clifford J. Grube was made New York district sales manager for industrial products of **General Plate Div.**, Metals & Controls Corp.

Simonds Worden White Co., Dayton, Ohio, appointed **Donald R. Stewart** district sales manager; **Kenneth E. Melvin**, sales representative. Mr. Stewart is responsible for grinding wheel sales in Michigan and

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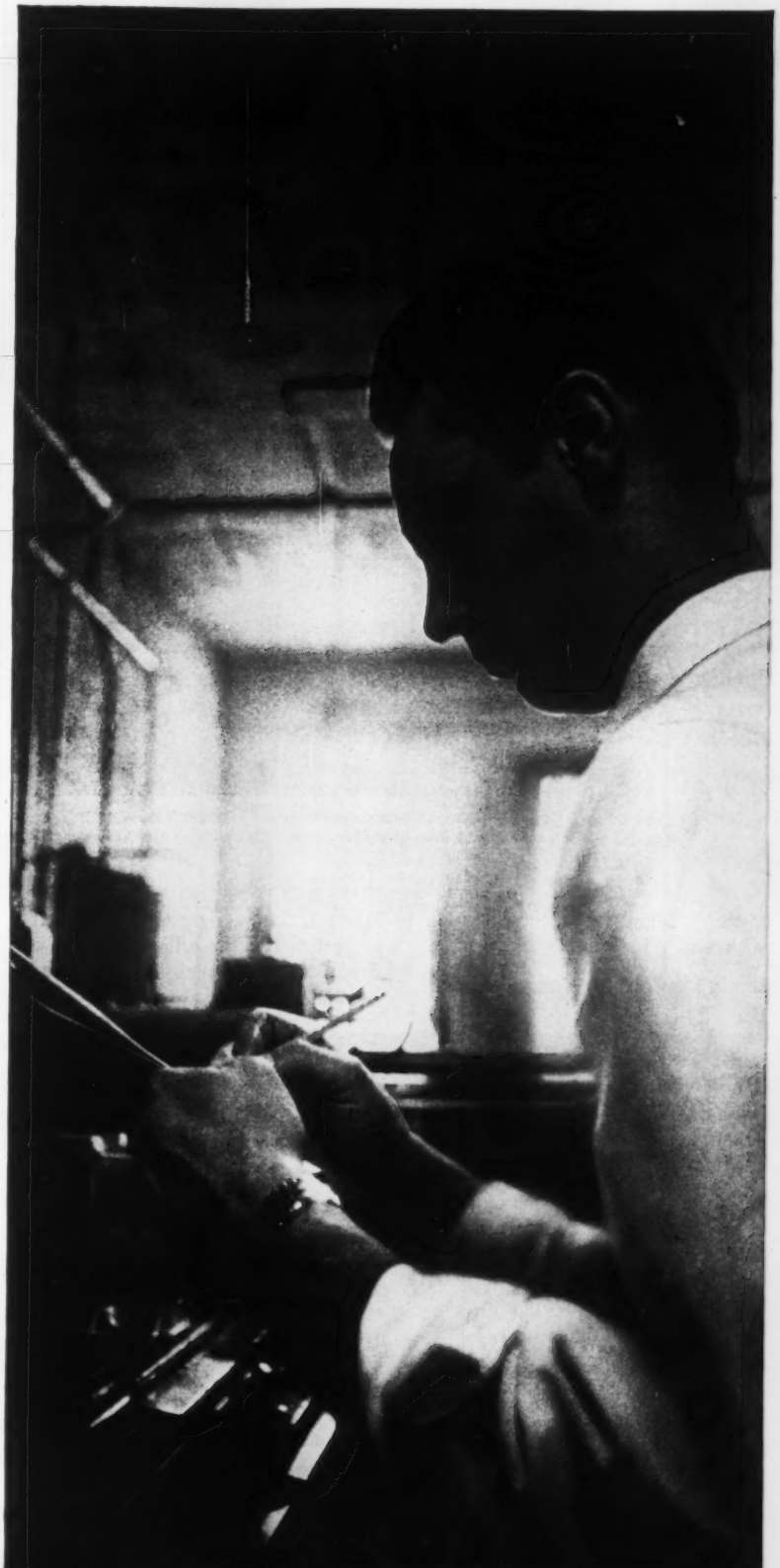

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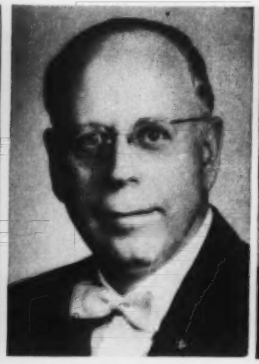
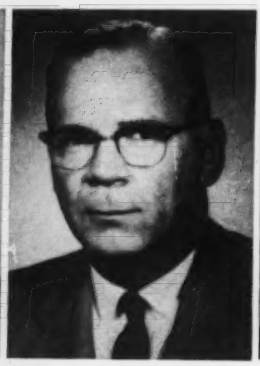
BOYD P. DOTY JR.
AS&W gen. sales mgr.



HARRY TIFFANY
Sahlin Eng. post

CLYDE H. WYMAN
Exomet mgr.-Alloy Div.

LESTER M. COLE
Warner & Swasey v. p.-sales



HARRY L. HUNTSINGER
Potter & Brumfield exec. v. p.

ROBERT M. MILLER
Onsrud v. p.-gen. sales mgr.

northern Ohio. Mr. Stewart will work under his direction.

Lester M. Cole, general sales manager, was elected vice president-sales, **Warney & Swasey Co.**, Cleveland. In his new post, he directs all sales activities of the company's Machine Tool Div., as well as those of the Textile Machinery Div. and Earthmoving Equipment Div.

Bernard W. Didsbury was made assistant general manager, Buffalo plant, **Farrel-Birmingham Co. Inc.** He was superintendent of the Ansonia, Conn., machine and erecting departments.

Bennett Archambault, president and chief executive officer, **Stewart-Warner Corp.**, Chicago, was elected to the additional position of chairman to succeed the late **James S. Knowlson.**

Robert L. Carbeau was elected president of **Universal Mfg. Corp.**, Zelienople, Pa. He succeeds **J. A. Kirkpatrick**, resigned. Mr. Carbeau was vice president-sales and finance.

Harry L. Huntsinger was appointed executive vice president, **Potter & Brumfield Inc.**, Princeton, Ind., subsidiary of American Machine & Foundry Co. He was assistant general manager, RBM Div., Essex Wire Corp.

Robert M. Miller was promoted to vice president and general sales manager, **Onsrud Machine Works Inc.**, Niles, Ill.

Herman R. Brown was made sales manager, Payloader Div., **Frank G. Hough Co.**, Libertyville, Ill. He was western regional manager and is succeeded by **Donald O. Ross**, former district manager. **Kenneth P. Larkin** was made eastern regional manager; **Robert L. Knox**, central regional manager.

John C. Mevius was appointed sales manager, Indiana Div., **Robertshaw-Fulton Controls Co.**, a newly formed branch. **Benjamin D. Odom** was made southern district sales manager for the division, headquartered at Chattanooga, Tenn.

Boyd P. Doty Jr. succeeds **Howard B. McGuire**, retired, as general manager of sales, **American Steel & Wire Div.**, Cleveland, U. S. Steel Corp. Mr. Doty was Cleveland district sales manager, U. S. Steel.

Harry Tiffany was appointed head of special products for **Sahlin Engineering Co.**, Birmingham, Mich. He is responsible for development of special machinery for mechanical handling of sheet metal in pressrooms.

Clyde H. Wyman was appointed to the new post of manager, Alloy Div., **Exomet Inc.**, Conneaut, Ohio. He was chief foundry metallurgist for L. F. M. Mfg. Co. Inc., division of Rockwell Mfg. Co., Atchison, Kans.

William Sivyer was appointed manager, Conveyor & Process Equipment Div., **Chain Belt Co.**, Milwaukee, to succeed **Robert T. Steindorf**, who was appointed director of research and development. Mr. Sivyer was central regional sales manager, industrial section. **Wyatt W. Dawson Jr.**, southern regional sales manager, Los Angeles, moves to Milwaukee to become central and southern regional manager.

Frank I. Clark was appointed vice president-sales, **Southern Steel Service Co. Inc.**, Orlando, Fla.

William I. Pell was appointed sales manager, Steel Products Div., **Kerotest Mfg. Co.**, Pittsburgh. He was manager of pipe sales for Colorado Fuel & Iron Corp.

OBITUARIES...

Paul I. Birchard, 54, vice president-manufacturing and engineering, **Westinghouse Air Brake Co.**, Pittsburgh, died Mar. 20.

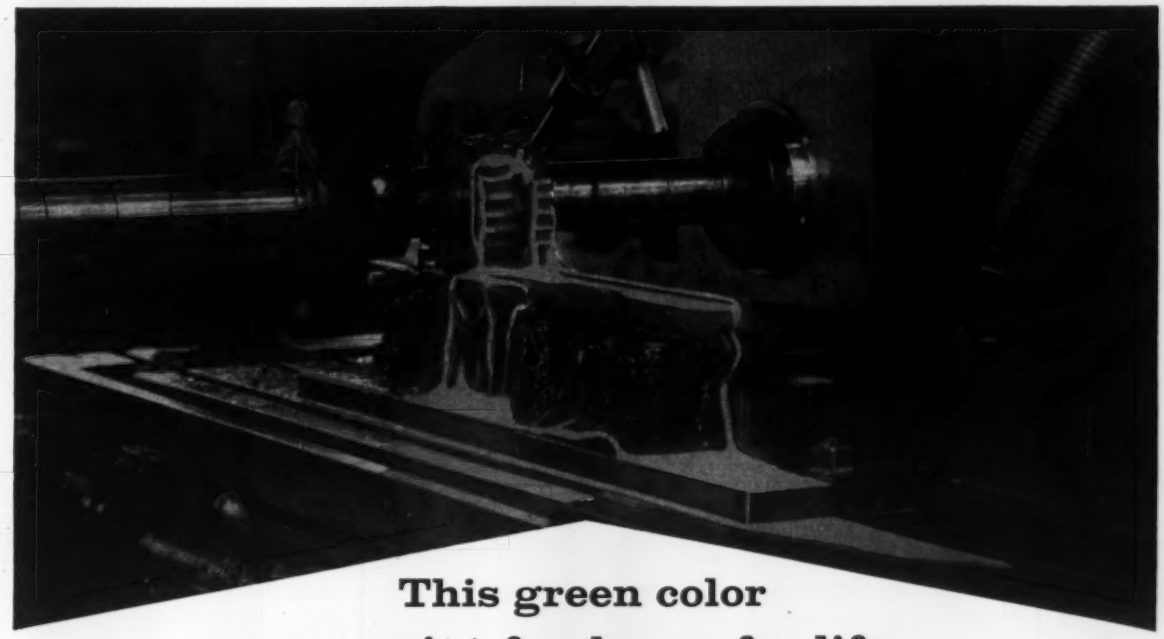
George Bissett, 72, president, **Bissett Steel Co.**, Cleveland, died Mar. 29.

Ernest C. Boyd, 65, former vice president, **Reed & Prince Mfg. Co.**, Worcester, Mass., died Mar. 21.

Paul D. Wood, director of industrial relations, **Alan Wood Steel Co.**, Philadelphia, died recently.

Alfred G. Gibbons, 78, chairman, **National Rivet & Mfg. Co.** and **Shaler Co.**, both in Waupun, Wis., died Mar. 18.

a "NEW LEAF" in coolants... New 100% Chemi-Cool HOCUT cools... lubricates... prevents rust... stays mint-fresh for life!



This green color means mint-freshness for life...

it's NEW HOCUT 237

New HOCUT 237, Houghton's latest and most versatile synthetic cutting fluid, needs no expensive additive to stay permanently clear, clean and fresh in your machines, for months.

In plain dollars and cents, this means you seldom have to change coolants, you have less costly downtime, no dumping problems, and you get better work. Your plant stays clean and your operators stay happy. Best yet, HOCUT only costs a few pennies per gallon in your machines.

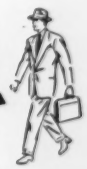
You can depend on HOCUT 237 for most every cutting or grinding operation in your plant. It cools work and tools quickly. A two-stage rust preventive protects work. Parts come off the machines faster, with finer finishes and closer tolerances.

For full information about new HOCUT 237, call your Houghton Man today. Or write: E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

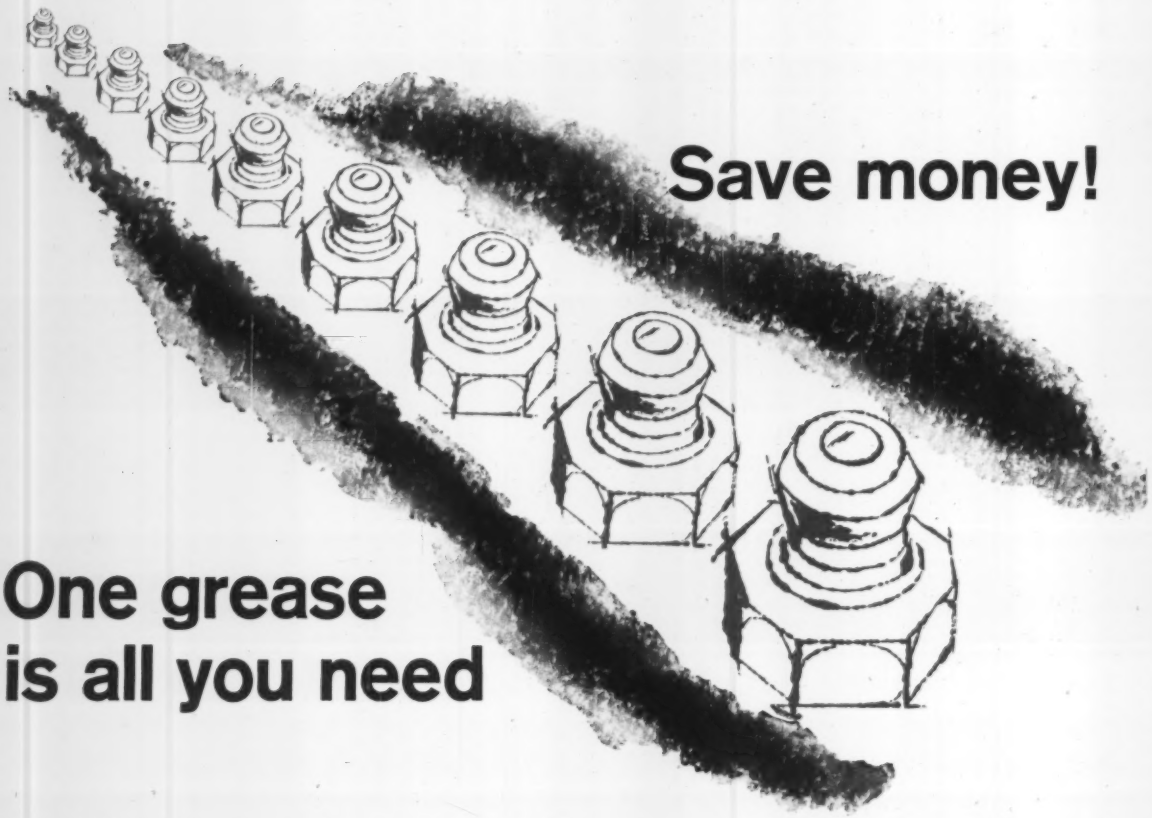
HOCUT 237 ... *a product of*

E. F. HOUGHTON & CO.

PHILADELPHIA • CHICAGO • DETROIT • SAN FRANCISCO • TORONTO



Ready to give you on-the-job service

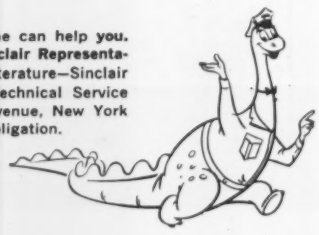


Save money!

One grease is all you need

If you use several greases to lubricate your plant equipment—stop! You'll save money with Sinclair Litholine® Industrial Grease because this one grease simplifies inventory, saves time. Recommended for all types of bearings. It has also earned an enviable reputation for high temperature bearing performance and mechanical stability. When management asks how you've cut costs, tell them you've switched to Sinclair Litholine and show them the results.

Find out how Litholine can help you. Call your nearest Sinclair Representative, or write for free literature—Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.



SINCLAIR

Litholine® Industrial Grease

Steel Improvement Subsidiary Enters Electrochemical Field

SIFCO METACHEMICAL INC., a newly formed subsidiary of Steel Improvement & Forge Co., Cleveland, has acquired the business and assets of the parent firm's Electrochemical Div. It has also purchased the licensing rights in Canada and the U. S. for a specialized plating technique known as the Dalic process, previously owned by Dalic Metachemical Ltd., Toronto, Ont. (see STEEL, Jan. 12, p. 76).

Steel Improvement holds more than 80 per cent of the stock of the new subsidiary. Associates in the venture are Metachemical Processes Ltd., London, England, and Laboratories Dalic, Paris, France. Steel Improvement has purchased a one-third interest in the English firm.

• **Mutual Aid**—Reciprocal technical licensing arrangements with the English and French companies give Sifco Metachemical the rights to all developments by the English and French companies in the electrochemical field.

A recent development by Metachemical Processes Ltd. is the micrograin nickel process for production of nickel electroforms. A pilot plant is being set up in Cleveland. The process is being applied widely in the British aircraft industry. U. S. firms are studying many possible applications.

Headquarters of Sifco Metachemical are at 935 E. 63rd St., Cleveland. President is A. H. Milnes, who is also executive vice president of Steel Improvement. Chairman is C. H. Smith Jr., also president of Steel Improvement.

Buys Merchant Bar Mill

Wisconsin Steel Div., International Harvester Co., Chicago, has ordered rolling mill equipment for its new $12 million merchant bar mill from Loewy-Hydropress Div., Baldwin-Lima-Hamilton Corp., New York. The contract includes a 14 stand, continuous bar mill, rebuilding of four, 21 in. breakdown mills, and the design and supply of auxiliary equipment, such as a billet unscrambler, furnace pushers, shears, and conveyors.

The mill is designed for a product mix that includes rounds, squares, and other bar products, as well as angles, channels and merchant sections, flats and spring steel.

Clearing Offering Englishmade Lathes

Clearing Div., U. S. Industries Inc., New York, will sell and service in the U. S. and Mexico a line of lathes made by T. J. Harrison & Sons Ltd., Heckmondwike, Yorkshire, England. Clearing is a leading manufacturer of hydraulic and mechanical presses of all types and has been making Axelson heavy duty engine lathes ranging from 16 in. to 120 in. The Clearing-Harrison line ranges from 11 in. to 16 in.

A. Leo West, executive vice president of Clearing, points out that the arrangement will enable U. S. plants to buy top quality lathes for about 25 per cent less than comparable American equipment. Example: A Clearing-Harrison 16-in. lathe will cost about $4500, against $6000 for a comparable U. S. lathe.

Develops Shearing Line

McKay Machine Co., Youngstown, has developed a compact steel shearing line designed for companies with limited floor space and a wide variety of strip cutting jobs. The device is fitted with an electronic programming apparatus so that it can instantaneously change the length of the sheet to be cut. A. J. Wardle Jr., president, says it occupies only two-thirds the space required by old type strip cutters.

To Make English Shapers

Gould & Eberhardt Inc., Irvington, N. J., has been licensed to make and sell Drummond Bros. Ltd. Maxicut 2A and 3A gear shaping machines in the U. S. Until the machines can be manufactured in its own plant, Gould & Eberhardt will offer gear shapers made by Drummond at Guildford, England.

Gould & Eberhardt has granted Drummond a license to build certain sizes of its gear hobbing machines in England.

Kearney & Trecker Forms Contract Div.

Kearney & Trecker, Milwaukee machine tool builder, has established a Contract Div. to handle all types of subcontract work for other industries. Besides contract work on special purpose machinery, the division's sales efforts will be aimed primarily at two other fields: Specialty work in the areas of aircraft, missile, and automotive production; and general purpose work which would employ such of the company's production facilities which are not otherwise available to defense industry contractors and to producers of capital and consumer goods. Officials of the division include E. H. Behrens, sales manager, and J. P. Bunce, manufacturing manager.

Ryerson Extends Service

Prestressing of concrete by the post-tensioning method is now offered by the Reinforcing Div., Joseph T. Ryerson & Son Inc., Chicago. The facilities are at Chicago and Los Angeles.

Seek Exposure Test Sites

The High Alloys Committee, Welding Research Council, is doing extensive field corrosion tests to determine what industrial process media cause intergranular attack of austenitic stainless steels. Industrial sites for corrosion test racks are sought. Those interested in participating in the program are invited to submit a description of the site to: R. M. Fuller, International Nickel Co. Inc., 67 Wall St., New York 5, N. Y.

Builds Plant in Canada

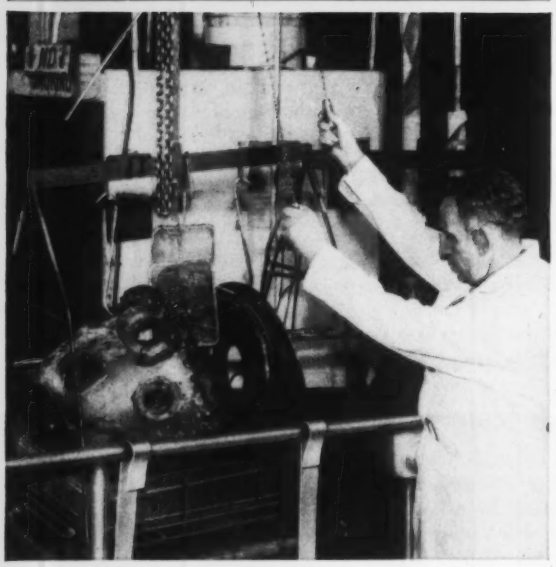
American Can Co. of Canada Ltd., Hamilton, Ont., is building a $5 million plant that will tailor tin

(*Please turn to Page* 134)

"COLUMBIA-SOUTHERN to be highly satisfactory for

says Mr. G. M. Pomeroy, Plant Engineer, Pacific Airmotive Corporation, Burbank, California

"Aircraft engine parts must be clean, and only the highest quality cleaning materials will do the job without damaging these expensive parts. Furthermore, maintenance costs are reduced because of reduction of manhours required for cleaning and maintaining of degreasers," says Mr. G. M. Pomeroy, PAC Plant Engineer.

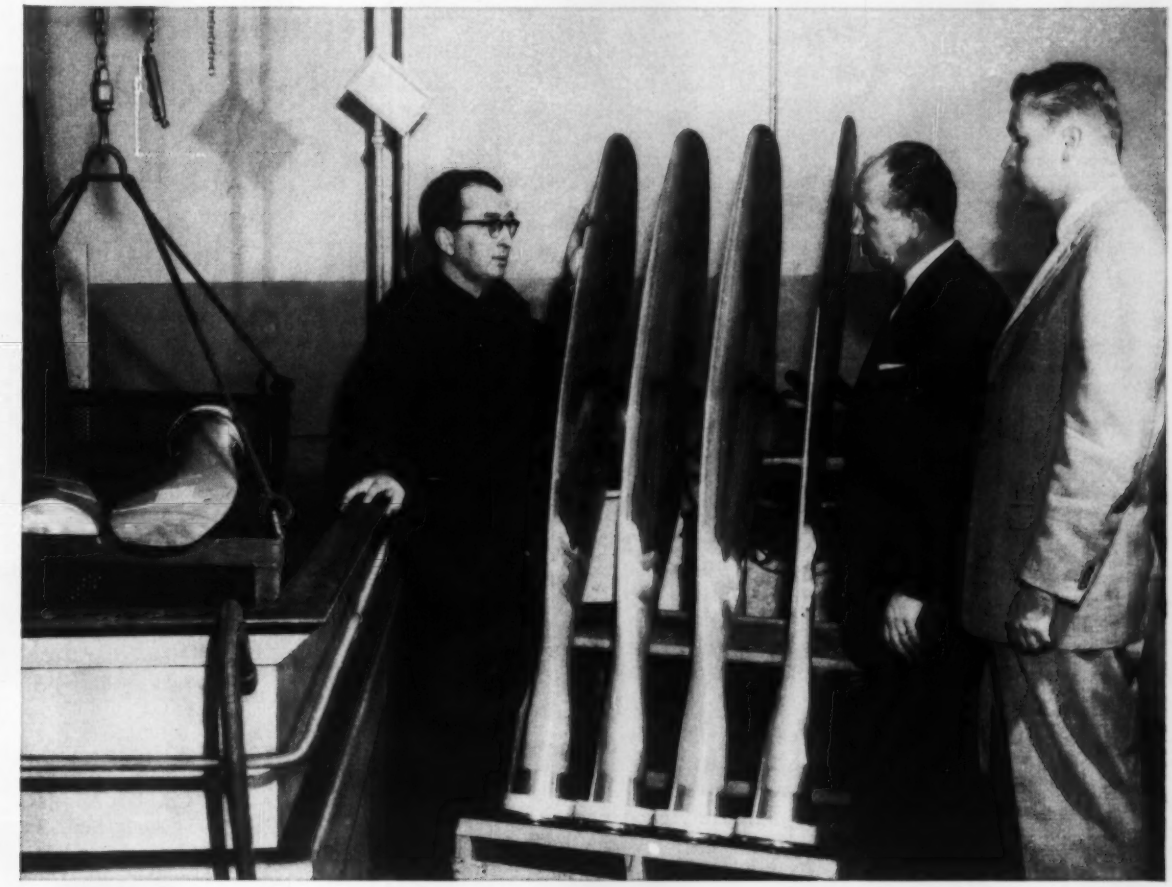


Pacific Airmotive Corporation's 30-year record of dependable aircraft and engine overhauls is unequalled in the aviation industry. It is the only FAA-approved private maintenance company authorized to overhaul the JT3 jet engine commercially. Pacific Airmotive Corporation's main plant is in Burbank, California.

"We have had no stoppage or damage to equipment since we started using Columbia-Southern Trichlor a year ago. It has extended our cleaning cycle per machine from 7 to 9 days, a saving of about 20 per cent. It also has reduced the actual downtime per machine during cleanout from 8 to 6 manhours, a further saving of 25 per cent."

"Before using Columbia-Southern Trichlor we tested many other trichlorethylenes. Many of them did an effective cleaning job, but the cleanout cycle was too frequent. Through the greater stability of Columbia-Southern Trichlor, we have extended that cycle and at the same time have increased the efficiency of our cleaning operation at Pacific Airmotive."

TRICHLOR has proved our high standard of operation"



Mr. G. M. Pomeroy (left), Plant Engineer Pacific Airmotive; Mr. Hal Wells (center), Vice President Crown Chemical & Engineering; Mr. H. R. Sherburne (right), Sales Representative Columbia-Southern.

"We have four degreasing machines which can handle up to 12,000 pounds of metal per hour. The solvent we use must be highly stabilized to protect the expensive parts that have to be cleaned. Some of these parts cost up to $12,000 apiece and we can't afford to risk the slightest damage in our cleaning operation. We have found Columbia-Southern Trichlor to be highly satisfactory for this purpose."

"Both producer and distributor—Columbia-Southern and Crown Chemical—give us excellent regular service in the form of technical help. This excellent service and the great efficiency of the solvent is very much appreciated and is a real asset to our operation."

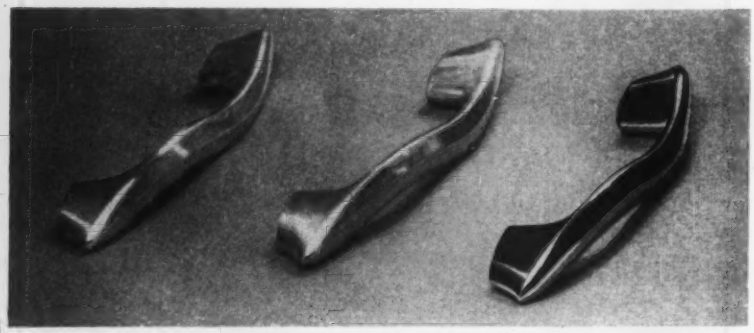
"I can honestly state that after conclusive tests on the production line, Columbia-Southern Trichlor has provided greater savings and most efficiency in our maintenance of degreasers."

For more information, contact our Pittsburgh address or any of the fourteen Columbia-Southern District Sales Offices

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company · One Gateway Center, Pittsburgh 22, Pennsylvania

DISTRICT OFFICES: Cincinnati · Charlotte · Chicago · Cleveland · Boston · New York · St. Louis · Minneapolis · New Orleans · Dallas · Houston Pittsburgh · Philadelphia · San Francisco. IN CANADA: Standard Chemical Limited



Three stages in the finishing of a zinc base die casting. Casting at left was buffed. Center casting was buffed and electrocleaned in Oakite 195. Casting at right was buffed, electrocleaned in Oakite 195, and plated. Note that center casting retains full buffed lustre and color after its electrocleaning in Oakite 195.

New electrocleaner for zinc die castings assures brighter plate... and cuts rejects!

Plating of zinc base die castings now becomes a more dependable, more economical operation with the introduction of Oakite 195, a *non-etch* anodic cleaner.

More dependable because the casting surface is not etched and its color not changed or darkened. Soils and films are effectively removed, yet the castings retain their buffed lustre. To help further in preparing the way for uniformly good plating results, this new electrocleaner has excellent rinsability in hot or cold water, and low foaming tendency.

And more economical by far, because of the sharp reduction in rejects due to poor pre-cleaning.

Oakite 195 can be used with direct, reverse and periodic reverse current, in still tanks and fully automatic set-ups. Where only a single solution tank is available, it is being used to clean a variety of metals—zinc, steel, brass, copper.

For more information about this important new development in cleaning before plating, write for descriptive folder F-10466 to Oakite Products, Inc., 34G Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

OAKITE®

MATERIALS · METHODS · SERVICE

SCIENCE

in our 50th year

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

(*Concluded from Page* 131)

plate from large coils into shapes for its Canadian canmaking plants. Tin plate mills are within a 10 minute drive by truck from the Canco plant site.

Republic Producing Wider Steel Mesh

Republic Steel Corp. has installed new machinery to produce wide steel mesh at its Gadsden, Ala., plant. The width limit has been extended from 9 ft 6 in. to 13 ft. Much of the mesh now being used for the reinforcement of concrete in highways is being ordered in the wider sizes. The mesh is also used for buildings and for concrete pipe reinforcement. The plant's Wire Mesh Dept. has been enlarged.

GE Quits Plastics Field

General Electric Co., Schenectady, N. Y., is withdrawing from the plastics manufacturing field. The plant and equipment at Taunton, Mass., is being sold to Haveg Industries Inc., Wilmington, Del. Much of the equipment at GE's Decatur, Ill., plant will be included in the sale.

Will Enlarge Tube Plant

Hughes Aircraft Co., Los Angeles, has leased a 23,000 sq ft building to be erected at Oceanside, Calif., for occupancy by its Vacuum Tube Products Div. The building will adjoin the 13,000 sq ft Vacuum Tube Products plant at 2020 Short St.

Erects Logan, Ohio, Plant

William Wallace Co., Belmont, Calif., manufacturer of gas vent pipe and chimneys, is building a $750,000 plant at Logan, Ohio. Completion is expected by July 15.

Gets New Coating Rights

National Research Corp., Cambridge, Mass., has licensed National Steel Corp., Pittsburgh, to use its developmental process for vacuum coating aluminum on steel sheets for containers and other products. Additional development engineering is required before commercial use

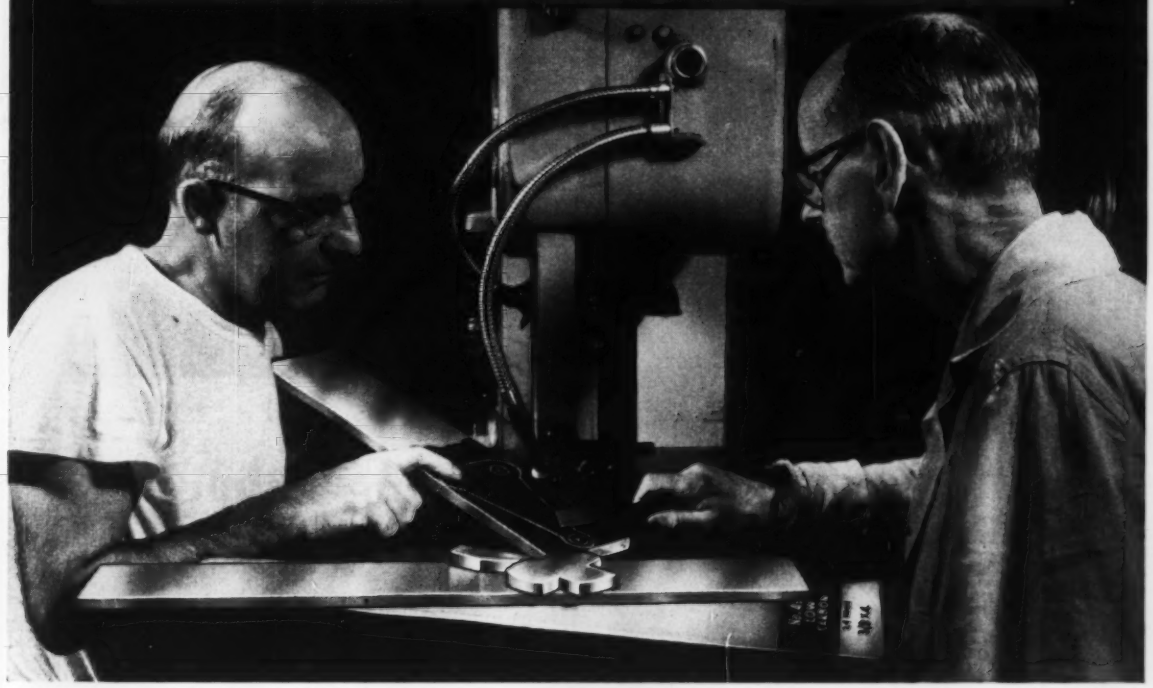
STARRETT PRECISION MAKES GOOD PRODUCTS BETTER

NO. 498 LOW CARBON FLAT STOCK

- 91% machinability — best of any flat stock.
- Saves up to 60% on material and finishing.
- Each piece identified full length.

TOOL STEEL DIE AND FLAT STOCKS

- 3 types — air, oil or water hardening.
- Over 1000 sizes, precision ground to Starrett standards of finish and accuracy.



STARRETT Precision Ground FLAT STOCK

now available in 4 TYPES for wider use, bigger savings

The time and money-saving advantages of Starrett Flat Stock and Die Stock are now greatly extended with the introduction of new Starrett *Free Machining-Low Carbon* Flat Stock.

This new fine grained, low carbon, silicon killed steel has 91% machinability — best of any flat stock. Available in 24″ lengths, 1/16″ to 2 7/8″ thicknesses, 3/8″ to 16″ widths. Can be used soft, carburized or case hardened. Each piece identified full length to avoid confusing with other steels and packaged in protective envelope.

Your nearby Industrial Supply Distributor also has Starrett tool steel Precision Ground Die and Flat Stock in three types — Air, Oil and Water Hardening. Flat stock in 18″ lengths, die stock in 36″ lengths — in over 1000 widths and thicknesses. Ask him for complete information or write for Bulletins 1109 and 1110. Address Dept. BG, The L. S. Starrett Company, Athol, Massachusetts, U. S. A.

Starrett®

FLAT STOCK and DIE STOCK

World's Greatest Toolmakers

STARRETT TOOLS

PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • GROUND FLAT STOCK • HACKSAWS • HOLE SAWS • BAND SAWS • BAND KNIVES

New "washing machine" makes CLEAN stainless steel

More often than not, titanium-bearing stainless can hike your fabrication costs . . . due to subsurface stringers or banding that cause excessive scrapping of parts. At Eastern, however, these harmful inclusions come out in the "wash."

Eastern's exclusive slag wash melting process produces the *cleanest* titanium-bearing stainless you can buy . . . exceptionally free from non-metallic contaminants . . . and at *no extra cost.* Eastern's new high-capacity slag furnace will meet industry's growing demand for such titanium-bearing steels as 321SW, 19-9DL, A-286, 19-9DX. Which do *you* need—and how fast?

EASTERN STAINLESS STEEL

Baltimore 3, Maryland, U. S. A.

of the process for containers can be undertaken.

CONSOLIDATIONS

Jessop Steel Co., Washington, Pa., acquired **Steel Warehousing Corp.**, Chicago and Broadview, Ill., and will operate the property as a wholly owned subsidiary. A. J. Kueber continues as president, while F. B. Rackley, president of Jessop, becomes chairman of Steel Warehousing. Jessop will spend $2 million "to increase warehouse stocks and to expand the Broadview installation," says Mr. Kueber.

Cadre Industries Corp., Endwell, N. Y., purchased **Mastercraft Trailers Corp.**, Middletown, Conn., producer of boat trailers.

Universal Controls Inc., New York, acquired **Grant Money Meters Co.**, Providence, R. I., manufacturer of automatic toll collectors and fare registers.

New York Shipbuilding Corp., Camden, N. J., will acquire **Higgins Inc.**, New Orleans boat building firm. subject to approval by holders of 80 per cent of Higgins stock.

Snyder Corp., Detroit, purchased **Hope Machine Co.**, Philadelphia. The new line of filling machines will be built in plants of Arthur Colton Co., a division of Snyder.

Hitchiner Mfg. Co. Inc., acquired **Permattach Diamond Tool Co. Inc.**, both of Milford, N. H. and will continue to operate the property under the name of Permattach Diamond Tool Corp.

Dayton Rubber Co., Dayton, Ohio, purchased two aircraft equipment manufacturing firms: **Hardman Tool & Engineering Co.**, Los Angeles; and **Aircraft Standards Inc.**, Santa Monica, Calif., manufacturer of tools, dies, and fixtures.

Whitin Machine Works, Whitinsville, Mass., has arranged to purchase **American Type Founders Co. Inc.**, Elizabeth, N. J. Whitin manufactures textile preparatory ma-

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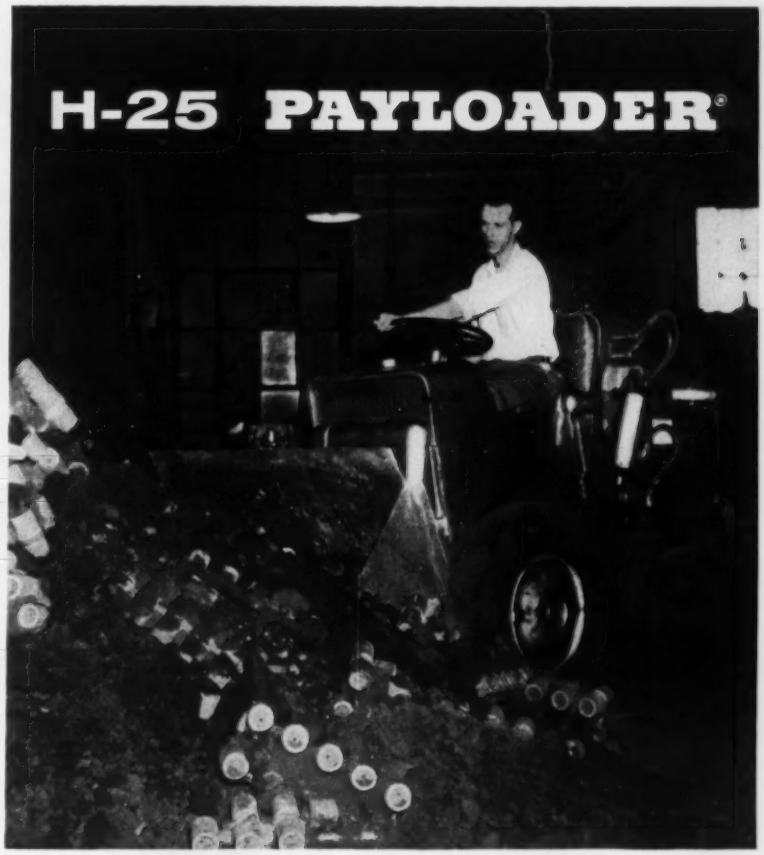

"bigger loads–faster–more powerful–considerably shorter turning radius"

Mr. O. W. Street, Gen. Supt. of Parker-Street Castings Company, Cleveland, Ohio also adds that "the Model H-25 'PAYLOADER' is superior to any previous sandmoving equipment used — also does numerous jobs previously impossible to do with our other loaders."

360 Tons Per Day

This gray iron foundry uses the H-25 for three basic jobs each day: pick-up of sand and castings from the floor and delivering same to shake-out; moving sand from shake-out to muller; delivering sand to the many molding stations. Average haul is 140 feet and the amount moved daily is 120 tons in each operation, or 360 tons total.

The greater carry capacity of the Model H-25 (2,500 lbs.) is 25 to 50% more than heretofore available in a tractor-shovel with 6-ft. turning radius. The power-shift transmission, torque converter and power steer make it fast cycling and easy operating. Power-transfer differential — another exclusive in its class — gives the Model H-25 better traction on loose or slippery footing.

Get the facts on the Model H-25 from your Hough Distributor.

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SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
876 Sunnyside Ave., Libertyville, Ill.

Send Model H-25 PAYLOADER data.

Name
Title
Company
Address
City State

4-A-2

at Smith & Cross

. . . with the help of the Ætna Life's Business Planning Department

Arthur H. Smith and Robert Cross are partners in a machinery business. Their company has grown over the years and looks to a prosperous future. Both Smith and Cross are known as good businessmen. They are aware that when either of them dies the partnership, by law, ceases to exist. The surviving partner and the heirs of the deceased partner are left to pick up the pieces. Therefore, with the help of their Ætna Life representative, attorney and accountant, they set up a plan to assure continuation of the business and security for their own families. If you own or operate any kind of business, it will pay you to investigate the vital need for a business continuation plan — and no one is better equipped to serve your interests than the Business Planning Department of your local Ætna Life General Agency.

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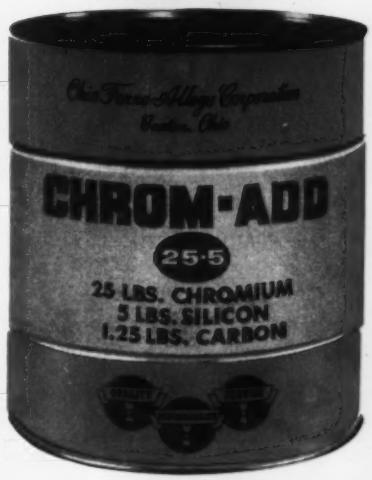
NEW EXOTHERMIC ALLOY!

CHROM-ADD 25-5



THE CHROME YOU NEED
THE SILICON YOU WANT

. . . . . and at Lower Cost!

You can now reduce your chromium and silicon costs with CHROM-ADD 25-5, a new exothermic alloy from Ohio Ferroy-Alloys.

CHROM-ADD 25-5 was developed specifically as an economical way to add chromium and silicon to open hearth steel. CHROM-ADD 25-5 embodies the convenience and consistently high alloy recovery you've come to expect of exothermic ladle additions. **Costs are competitive with practices that now require furnace additions of lump alloys.** You also eliminate the costs of weighing and handling bulk alloys, save furnace time . . reduce fuel and refractory costs.

CHROM-ADD 25-5 is packed in sealed steel cans each containing 25 lbs. of chromium and 5 lbs. of silicon. For each 1% chromium addition, you get .20% silicon. Consequently, supplemental ladle additions of ferrosilicon are substantially reduced or, in many cases, not required at all.

Get the facts now on CHROM-ADD 25-5 . . . the accurate, convenient and economical way to produce chromium steel in the open hearth. Our nearest sales office will be glad to give you full details.

QUALITY · DEPENDABILITY · SERVICE

Ohio Ferro-Alloys Corporation
Canton, Ohio

Birmingham • Boston • Chicago • Denver • Detroit • Houston • Kansas City • Los Angeles
Minneapolis • Philadelphia • Pittsburgh • Salt Lake City • San Francisco • Seattle • Vancover, B. C.

ANOTHER ADVANTAGE: Pallets holding sixty cans for convenient handling and storage.

Built by
HEVI-DUTY
specialists in
industrial furnaces

Clean-Line Furnaces Demonstrate The Ultimate in Automatic Heat Treating At Superior Metal Treating Corp.

Superior Metal Treating Corp., Muncie, Indiana, was so pleased with the performance of a Clean-Line furnace under conditions that really test — and prove — heat treating equipment, that they recently installed a second identical furnace. The Hevi-Duty furnaces are used 24 hours a day, 5 days a week for carburizing, carbonitriding and bright hardening. Heating and cooling, or oil quenching, are automatically timed and controlled. The operations are done under protective atmosphere.

The furnaces produce full uniform hardness and depth, even in 500-lb loads of small parts. Heating cycles are as short as 20 minutes, and temperatures range up to 1925° F.

In the original furnace, radiant tubes are still in good condition after a year of use under these demanding conditions. This Clean-Line furnace uses only about 300 CFH of prepared atmosphere, further evidence of its excellent efficiency.

Perhaps this combination of durability and automatically controlled production has a place in your heat treating operation. For full information, write for Bulletin D-100.

- Industrial Furnaces electric and fuel
- Laboratory Furnaces
- Dry Type Transformers
- Constant Current Regulators

HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

(Concluded from Page 137)

chinery. ATF, operating in the graphic arts field, will continue to do business under its present name at its Elizabeth offices.

Vanadium Corp. of America, New York, will merge **Keokuk Electro-Metals Co.,** Keokuk, Iowa, into the corporation upon stockholder approval.

Pfaudler Permutit Inc., Rochester, N. Y., has purchased **Ideal Welding Co. Ltd.,** Toronto, Ont., a metal fabricator. It will become a wholly owned subsidiary.

National Cored Forgings Inc., Norwalk, Conn., a subsidiary of **Bridgeport Brass Co.,** Bridgeport, Conn., since 1955, has been integrated with the parent company, operating as the Cored Forging Div. No organizational changes have been made.

NEW PLANTS

Nice Ball Bearing Co., Philadelphia, has broken ground for a new plant addition in Montgomery County, Pa., about 30 miles north of the present plant. Adding 40,000 sq ft of manufacturing area, it is the company's four major expansion since World War II. Plans call for the eventual completion of 275,000 sq ft at the new site.

ASSOCIATIONS

Metal Grating Institute, Pittsburgh, elected J. Edinson vice president. He is general sales manager of the Klemp Metal Grating Corp., Chicago. Hanson & Shea Inc., Pittsburgh, has been retained to provide management services.

Zirconium Association has been organized at 2130 Keith Bldg., Cleveland 15, Ohio. W. B. Thomas is executive director. Members include companies that produce, melt, and process the metal.

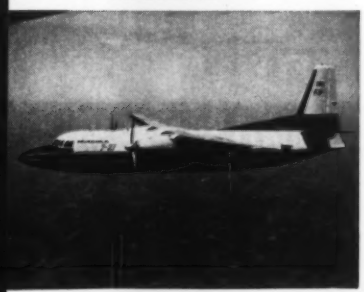
Industrial Heating Equipment Association has elected Robert K. Baker, assistant manager, Industrial

New Trend in Steel Buying: Many profit-conscious manufacturers taking a long, hard look at steel buying policies; more and more of them cutting costs by purchasing more steel *as it's needed and ready for production* from modern Steel Service Centers.

"Critically needed alloys make 24-hour deliveries a must!"

Prompt deliveries from U. S. Steel Supply help keep this F-27 production line on the move!

The Fairchild F-27, first American-made turbine-powered airliner.



says Mr. V. N. Thacker, Assistant Materials Manager, Fairchild Aircraft & Missiles Division, Fairchild Engine & Airplane Corporation, Hagerstown, Maryland

"We're now producing the first American-made turbine-powered airliner—the Fairchild F-27 Propjet," says Mr. Thacker. "Naturally, during the first months of production with an all-new aircraft modifications are necessary. But despite these changes, which result in last-minute orders, U. S. Steel Supply gives us delivery of the material we need . . . when we need it.

"Here's an example: We ordered 50 feet of 4130 steel, measuring ⅜" x 1", which we needed within 24 hours. Granted, it was a small order, but it was *vital* to the F-27. U. S. Steel Supply delivered it in less than a day, saving many valuable man-hours."

Why not take a close look at *your* steel buying policies—you'll find U. S. Steel Supply's pamphlet entitled "Value Analysis at Work" very helpful. Write to our Chicago Office, or call your nearest U.S. Steel Supply Steel Service Center. You'll find us in the Yellow Pages listed under *Steel*.

USS is a registered trademark

U. S. Steel Supply Division of USS **United States Steel**

Steel Service Centers and Complete Steel Strapping Service at: Baltimore, Birmingham, Boston, Chicago, Moline, Cleveland, Houston, Dallas, Los Angeles, Milwaukee, Newark, Southington (Conn.), Philadelphia, Seattle, Portland (Ore.), Pittsburgh, St. Louis St. Paul, San Francisco. • General Offices: 208 South La Salle Street, Chicago 4, Ill.

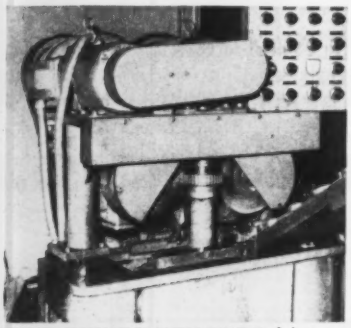
OSBORN®

BEFORE BRUSHING—Automotive clutch component . . . with sharp edges plus fine machining chips and burrs still carried inside teeth.

AFTER BRUSHING—Edges and surface junctures are uniformly precision blended. Chips and burrs are thoroughly removed to help assure troublefree operation of the installed part.

Precision finish . . . in 7 seconds flat

. . . capacity 360 parts-per-hour with OSBORN Power Brushing



TWIN POWER BRUSHES deburr and edge-blend these parts on 7-second cycles. Osborn 6" Monitor® Brushes—operating at 1750 rpm—do the job at high production rates. Quality is excellent . . . cost is low.

IF you precision finish parts, and want to do the job faster . . . with improved quality . . . at less cost—today's Osborn Power Brushing methods can help you do it.

For example—this leading automotive parts manufacturer uses a dual-brush setup to automatically deburr and edge-blend precision clutch parts. In addition to the *versatility* and *precise quality control* he's afforded by Osborn Power Brushing—he finds finishing operations are done faster and at significantly lower cost.

It's typical of how *you* can pinpoint savings, too. An **O**sborn **B**rushing **A**nalysis—made in your plant at no cost or obligation—is the first step. Write us for full details. *The Osborn Manufacturing Company, Dept. S-6, Cleveland 14, Ohio.*

Osborn Brushes

BRUSHING MACHINES • BRUSHING METHODS
POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

Equipment Div., R. C. Mahon Co., Detroit, chairman of the newly created Oven Div.

NEW ADDRESSES

American Smelting & Refining Co., New York, moved the Detroit sales office of its **Federated Metals Div.** to 522 New Center Bldg., 7430 Second Ave., Detroit 2, Mich.

Headquarters of the general sales manager, G. H. Sanborn, and the assistant general sales manager, Stewart Barton, of **Fellows Gear Shaper Co.** have been transferred from Detroit to the main plant in Springfield, Vt. The Detroit branch office will be continued with A. R. Tobin as manager.

National Tank & Boiler Co., Hazelwood, Mo., has moved to its new plant and offices. The mailing address is P. O. Box 126.

NEW OFFICES

Eastern Stainless Steel Corp., Baltimore, opened a branch sales office at 5935 S. Pulaski Rd., Chicago 29, Ill. Timothy F. O'Connell is the Chicago representative.

Bohn Aluminum & Brass Corp., Detroit, opened a district sales office at Grand Rapids, Mich., with L. K. Moore as district manager.

Charles Bruning Mfg. Co. Inc., Mt. Prospect, Ill., opened a branch office at Portland, Oreg.

Commercial Contracting Corp., press erectors and industrial equipment installers, moved to 32217 Stephenson Highway, Madison Heights, Mich.

Black & Decker Mfg. Co., Towson, Md., has opened a factory service branch at 227 Varick St., New York.

Borg-Warner Corp., Chicago, has opened a midwest district office at 2603 State St., Alton, Ill., for the application and sales of crane equipment.

Working proof of Superior stainless quality—*the year around*

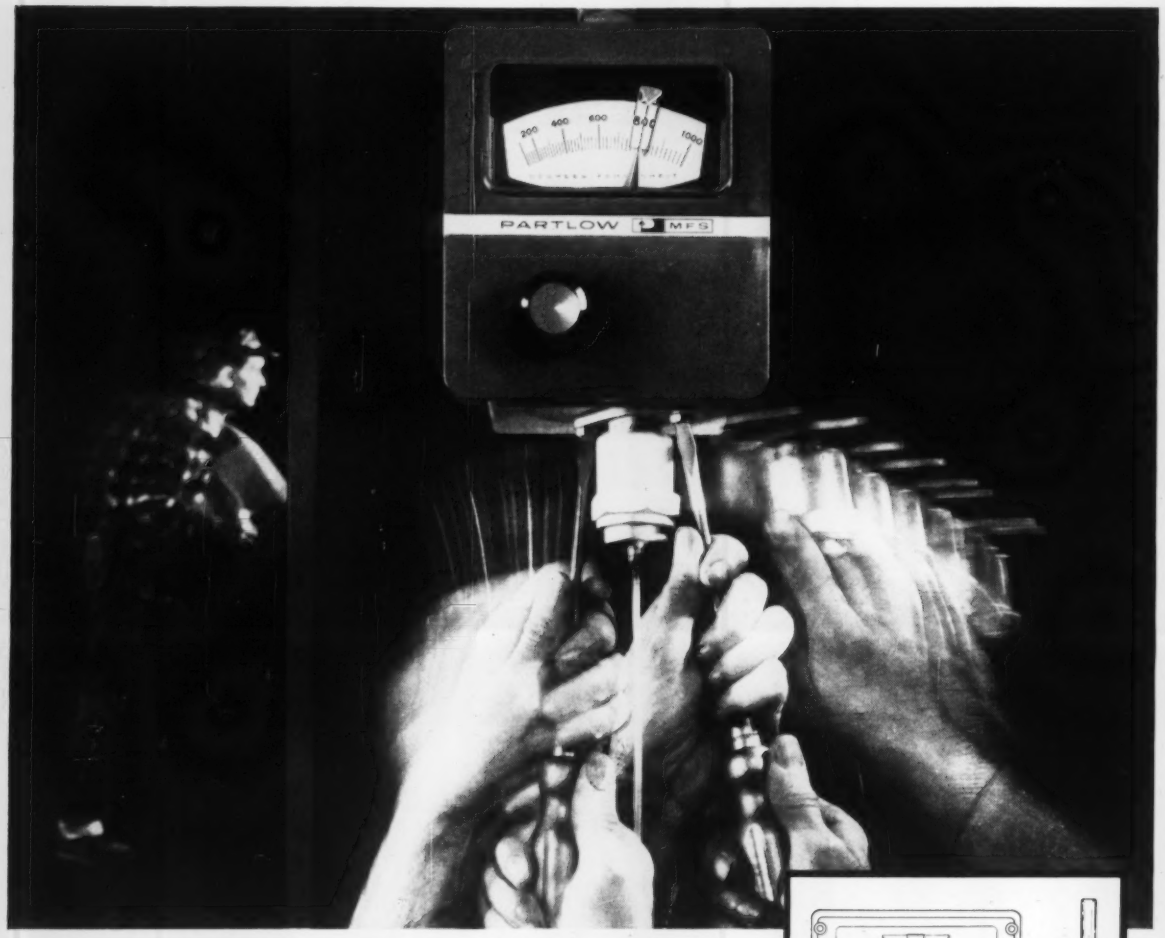
Superior

STAINLESS STRIP STEEL

Out front, and ever-bright—looking its best when the weather is worst—Superior Stainless in the millions of windshield wiper assemblies on today's cars speaks for *enduring quality*. The stainless strip is made right to behave right—uniform as can be, from coil to coil. • There's a Superior grade to meet *your* application in every particular. Write.

Superior Steel Division

OF



The Temperature Control Designed for Fast

"DO IT YOURSELF" MAINTENANCE

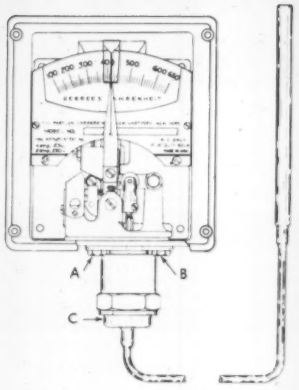
Right on the Job!

Rugged simplicity of design—along with the direct, positive power of mercury-actuation — combine to give Partlow maintenance and performance advantages no other type of temperature control can hope to equal.

Simplicity in the Partlow, for one thing, means that the control element can be changed *at the job site* in a matter of minutes with no other tool than a screwdriver . . . "Down time" is cut to an absolute minimum!

And simplicity in the Partlow also means the complete elimination of fussy electronic gadgets, delicate levers, hairsprings and other accessories that have a tendency to break down at the first trace of jar or jostle. Partlow controls are famous for their unfailingly accurate performance even under the most adverse operating conditions.

If you use or manufacture process equipment within the -30° to 1100° F. range, there's a Partlow pneumatic, electric or self-contained gas control (recording, indicating or non-indicating), to fit your application *precisely*. For details, write The Partlow Corp., New Hartford, New York. Dept. S-459.



Diagrammatic view of the new MFS reveals "quick-change" feature common to all Partlow controls. In case of damage, merely unscrew at points (A) and (B), and remove element (C) from case. Reverse this process, and your Partlow is ready to resume operation.

You can pay more but you can't buy better than

PARTLOW

TEMPERATURE CONTROLS

Export Ad, Auriema, Inc., 85 Broad St., New York 4, N. Y.

COOLER CRUCIBLES— Use of air cooling for molds, instead of water cooling, will help prevent explosions in melting zirconium and other reactive metals, reports the Bureau of Mines, Department of the Interior. Most of the vessels it tested were copper. One, with cooling fins, was 35 per cent more efficient than the water cooled types. Another approach: Maintain a skull of reactive metal in the crucible to dissipate heat generated during melting. (See STEEL, Mar. 9, p. 64.)

LATHE PAYOFF— A tape controlled turret lathe has cut 25 per cent off the setup and machining time for an aircraft builder. A report from Potter & Johnston Co., Pawtucket, R. I., says the machine, working on a regular production schedule, uses a punched tape that has eliminated up to 2 hours' setup time on some jobs.

MOLYBDENUM OUTPUT BOOSTED— Single stage reduction of molybdenum oxide could increase production of molybdenum powder five to eight times, claims Metals & Residues Inc., Springfield, N. J. B. H. Davidson, technical director, says the new process saves energy, makes purer metal, and recovers a higher percentage of metal from the oxide. Formerly, the oxide was reduced in two steps; to brown oxide at about 840° F, then to metal at about 1830° F.

BURY BUSHINGS IN PLASTIC— Increasing use of plastics for drill jigs and fixtures calls for special bushings, says Ex-Cell-O Corp., Detroit. The company makes fluted bushings, to be pressed into holes in soft, ductile materials, and herringbone-serrated bushings that are embedded in castable materials. They're made of standard bearing steel.

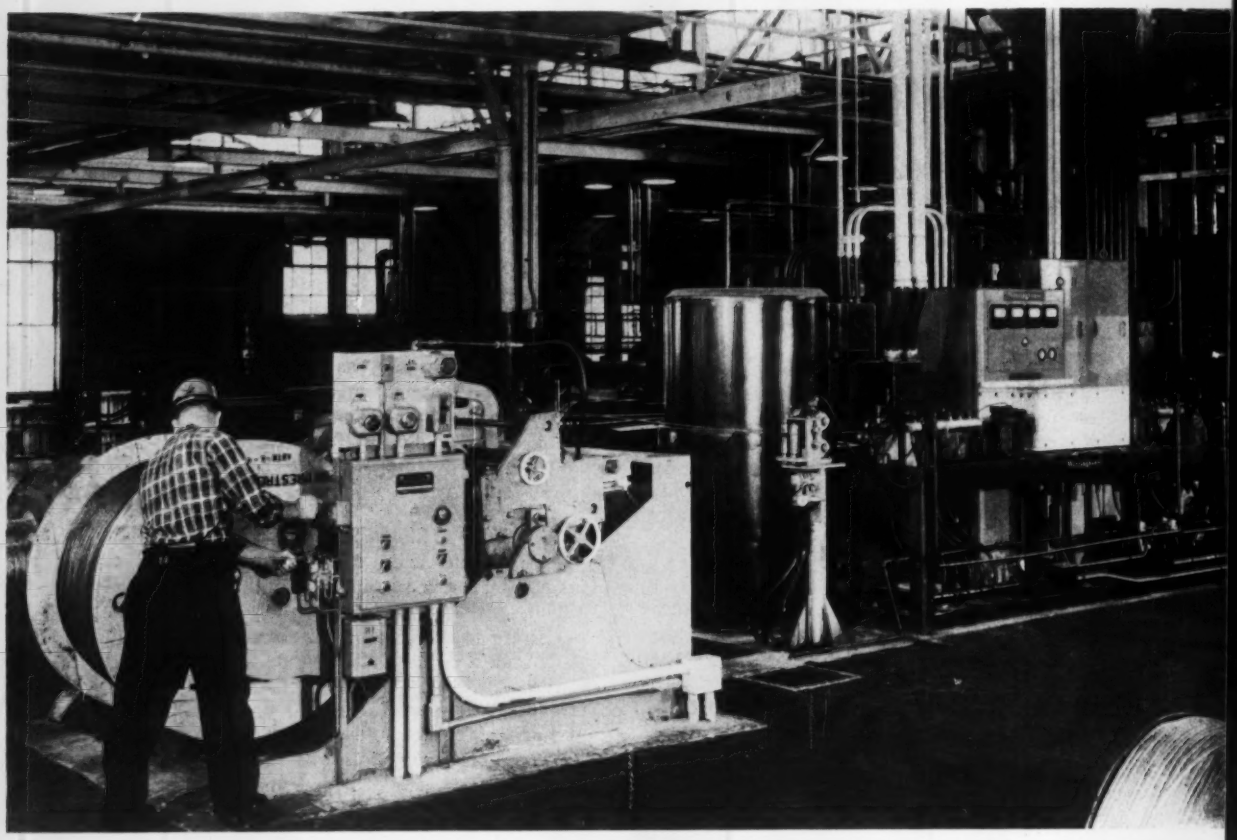
GOOD NEWS FOR HONEYCOMB— Aircraft and missile production is getting a helping hand from several new brazing techniques developed by North American Aviation Inc., Los Angeles. One eliminates 95 per cent of the argon formerly thought necessary for quality; another, called quench press brazing, eliminates the warping in small, shaped parts; a third method heats parts electrically (the parts themselves are resistance elements in an electrical circuit). North American experts say that the new brazing techniques have done much to overcome the honeycomb production problems for aircraft like the chemically propelled B-70 bomber and the supersecret F108.

HIGH TOP PRESSURE MADE SAFER— The practice of increasing top pressure to boost blast furnace output is gaining popularity among steelmakers. It's said to be safer when copper mantle plates are secured in their holders with Esscolator plate seal, a product of Esscolator Mfg. Co., Pittsburgh. It resists corrosion, abrasion, and friction. It can take temperatures of −40 to 400° F. It's easy to apply to any clean, dry surface, and cures at room temperature in 4 to 6 hours. For a quick seal, it can be cured with external heat in less than 5 minutes.

TANTALUM GAINS— Use of tantalum to make bayonet heaters for acid condensers and other process equipment is announced by Pfaudler Co., Rochester, N. Y., a division of Pfaudler Permutit Inc. The metal's high heat transfer rate, ductility, and resistance to physical or thermal shock make it suitable for use in the heaters, says Pfaudler. Because of its acid resistance, thinner walls can be used for more effective heating.

EXPLOSIVE FORMING IN SPACE— An entire missile or space platform may be formed in one piece with explosives, say experts who attended the Western Metal Congress at Los Angeles. One of them says explosives form an excellent aerodynamic shape. Space platforms components would be assembled on the ground and put into orbit before the explosives were detonated.

TUMBLING DEEP FREEZE— Barrel finishing will replace hand trimming for rubber parts, says Almco, Queen Products Div., King-Seeley Corp., Albert Lea, Minn. Its tumbling machines are refrigerated. Rubber parts, frozen with liquid carbon dioxide, have a metallic hardness. They're finished easily in tumblers.



Stranded steel cable passes through a looping tower and into induction coils for annealing. After quenching, it's wound on takeup reels

Induction Heating Equipment Is Fast, Flexible, Economical

Heaters should be tailored to applications. Purchase price, installation cost, and local electric rates must be considered in choosing the right unit for your plant

FACED with a heating problem in annealing, hardening, forging, or extrusion?

You'll want to look into the advantages offered by induction heating equipment.

You can learn how it has paid off in other plants and get some tips on using it in yours by reading a few case histories. They were collected by John Edwards, manager, Industrial Electronics Dept., Westinghouse Electric Corp., Baltimore.

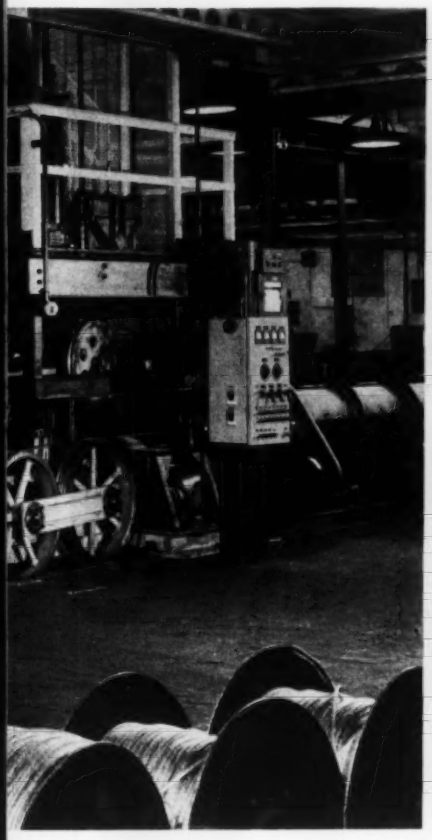
• **Heating Is Controlled**—Induction heating can be used in diverse applications; it can also be tailored to job requirements. Depth of hardness is easily controlled; short heating time (for metallurgical reasons or to reduce scale) is possible; and desired heat can be accurately maintained.

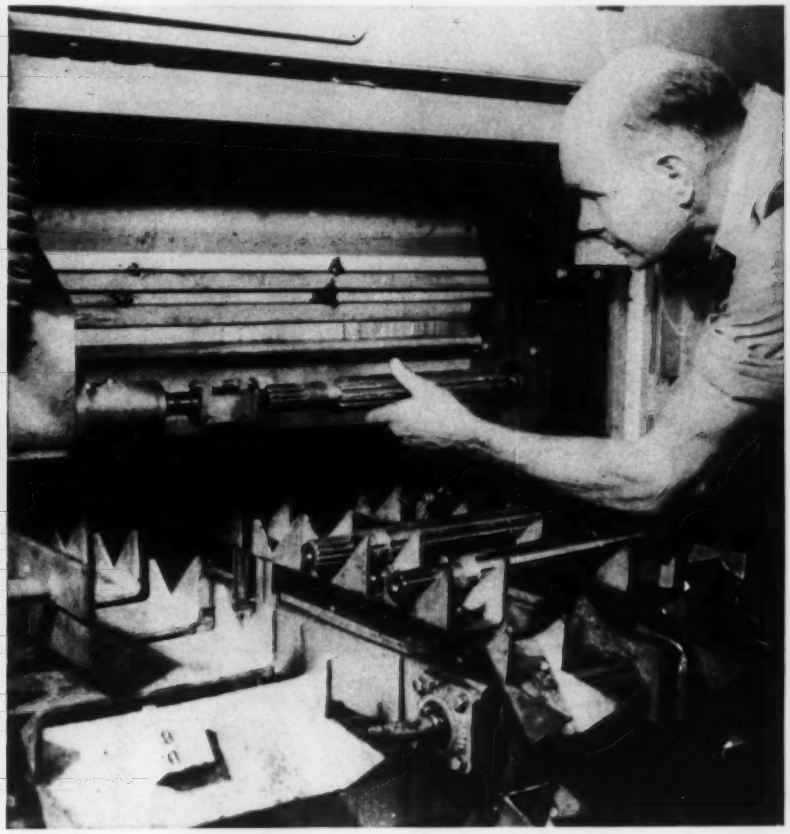
Selective heating makes it possible to harden only the four contact areas on a rocker arm shaft, leaving the other sections untreated. So, the shaft can be fed through a roll straightener without cracking the surface or leaving high residual stresses in hardened areas.

Shafts are rotated during heating and moved steadily through a heating coil and quench. They can be straightened automatically at low cost. The reject rate is low.

• **Choosing Equipment**—When induction heating equipment is purchased, the cost of radio frequency and motor-generators should be compared. Installation costs and operating efficiency of each should be studied.

The cost of installing radio frequency equipment is 3 to 6 per cent of purchase price, vs. 5 to 8 per cent for a motor-generator setup. Radio frequency generators operate at about 50 per cent efficiency, while motor-generators operate at about 80. Efficiency data should be obtained from the manufacturer for the size and frequency of the unit needed.





Operator checks tractor axle for proper centering in the hardening machine. Parts are positioned in the machine by an automatic conveyor

The duty cycle in each application must be considered. In many cases, full power will not be drawn continuously. Result: Lower power costs.

If operating efficiency, duty cycle, and local electric rates are known, energy cost can be calculated for the heating operation.

• **Case History**—Cable used in prestressed concrete is annealed automatically in one steel plant, saving the company about $18 a ton. The product isn't contaminated, and there's little heat loss.

The equipment anneals ½ in. cable at 250 fpm (or about 8000 lb per hour). Temperature is held within 30° F of a specified 625° F, while cable speed is 25 to 200 fpm; at production speed, temperature varies only 10° F.

The system backs up to anneal short lengths only partly heated when the machine stops, eliminating scrap.

Equipment was purchased for

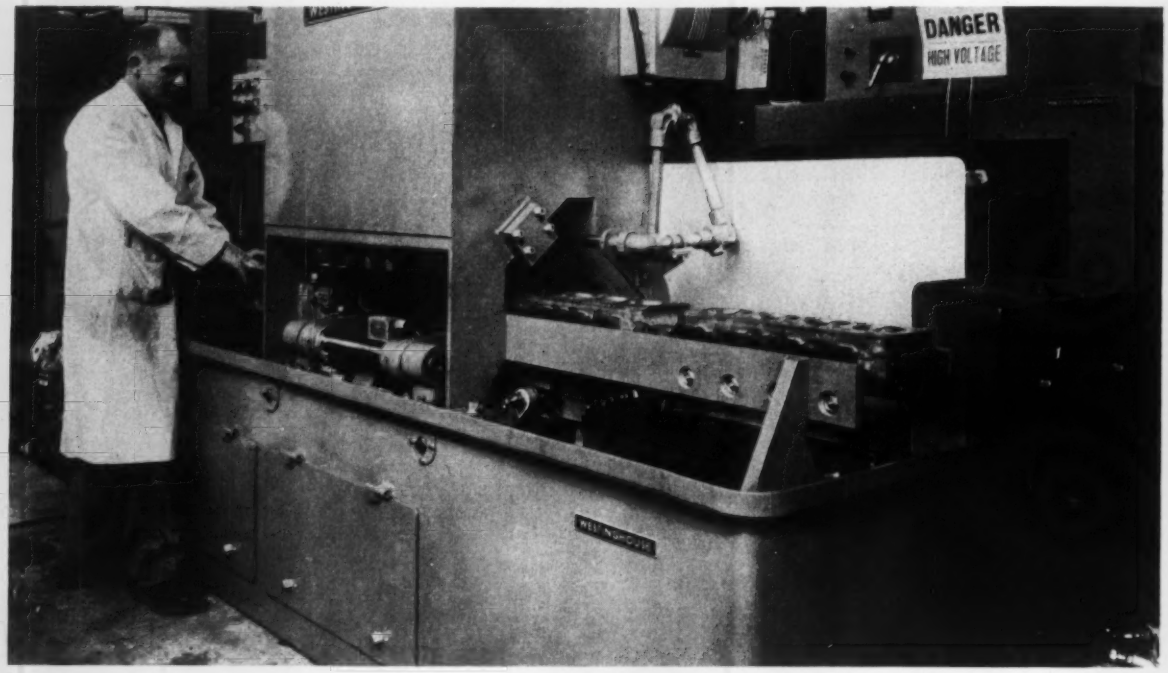
Four Advantages of the Method

There's no thermal lag as heat is turned on or off; it's generated rapidly in the material being treated.

Accurate control restricts heat to specific areas or depths; there's no appreciable radiation.

Materials aren't contaminated by the heat source, and scale is held to a minimum.

Equipment takes little floor space; it can be integrated with other automatic production machines.



Valve ports in automobile cylinder heads are hardened with induction heating equipment. Production costs are cut because inserts are no longer needed

$68,900. Operating cost, including a part time operator, is $3.93 an hour.

• **Valve Ports Hardened** — Valve seats take a beating and ports tend to erode in V-8 engines. Automobile makers can save $1 to $1.50 on each cylinder head through selective hardening, and elimination of inserts.

A complete motor-generator induction hardening system can be purchased for about $73,000. Power, maintenance, and labor costs total about $2.60 an hour (labor is estimated at $2 per hour). Operating two shifts a day and processing 125 heads an hour, the system will save about $425,000 a year.

• **Helps Make Valves**—Upsetting, the final step in making automotive valves, is done more economically by a large manufacturer with three induction heating systems. Each heater, powered by a 50 kw, 10 kc motor-generator set, heats valve "onions" to 2100° F, turning out 1800 pieces an hour. Capital investment for each unit is $37,000; the power and maintenance cost is 96 cents per hour.

Short heating time minimizes heat conduction in the valve stems. Each unit has a short zone heating coil and an automatic turntable. They are incorporated in fully automated lines.

• **Savings on Axles**—Two horizontal, axle hardening machines have processed 15 million axles in one automobile plant; no metallurgical failures have been reported. Inspection and control of steel composition are cut to a minimum; less pretreatment is required because heat stored in the axles produces some stress relief. Distortion is said to be less than with other hardening methods; and straightening costs are reduced.

It cost $195,400 to install the machines. Better hardening permits use of less expensive steel, and saves the company 30 cents on each axle. Processing 425 axles an hour, and operating on two shifts, the machines save $434,000 a year. Both machines are operated by one man; power, maintenance, and labor costs come to only $10.40 an hour.

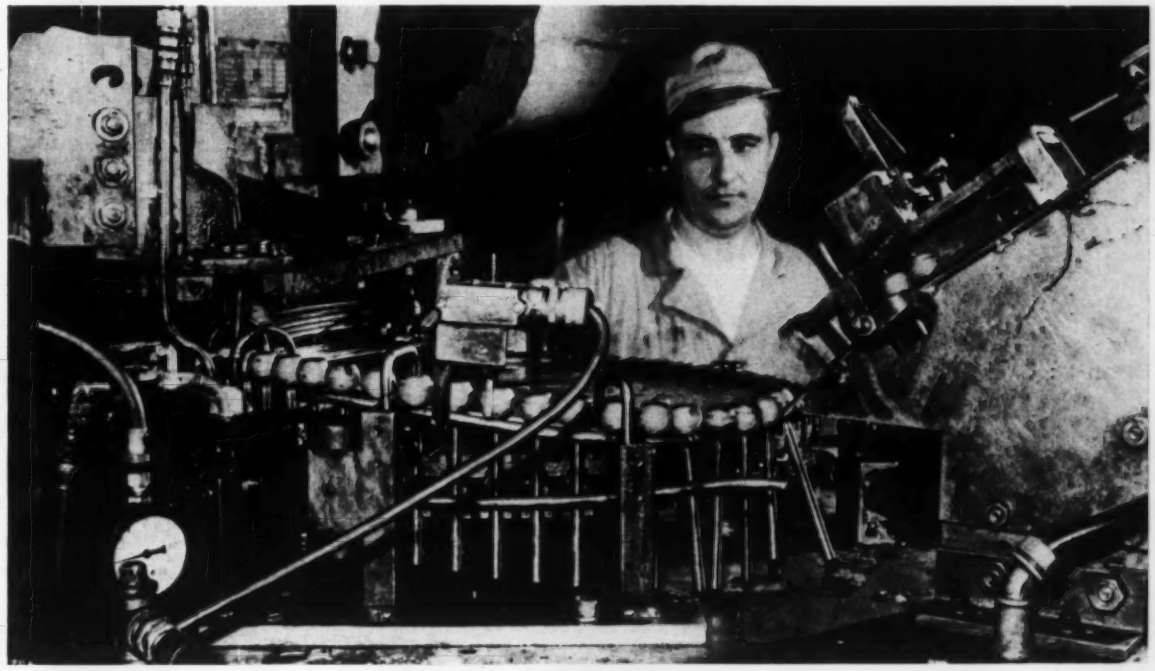
Makers of farm machinery are also cutting costs by hardening axles with automatic induction heating equipment. Greater strength, resulting from a hard case and tough core, makes it possible for smaller axle shafts, housings, bearings, and gears to carry greater loads. The system is operated by one man; use of less expensive steel cuts material costs $1 per axle, and machining costs are reduced.

A typical setup, costing $70,100, processes 15 tractor axles an hour. Total operating cost for the equipment is $4.75 an hour. In two shift operation, $60,000 a year is saved in material alone.

• **Forging Aided**—Induction heating, using motor-generator frequencies, is gaining popularity in steel forging operations because of favorable capital and operating costs and the small amount of scale produced.

A typical installation in an automotive forge plant includes three connecting rod billet heaters. The units, drawing power from a 1250 kw, 3 kc, motor-generator set, heat 1000 billets, 13 in. long, to 2250° F in an hour. Each billet is heated in 3 minutes. Cost of the equipment, including three forging machines, was $194,100; it's operated for only $14.70 an hour.

Two large companies recently installed 60 cycle induction equipment to heat billets as heavy as



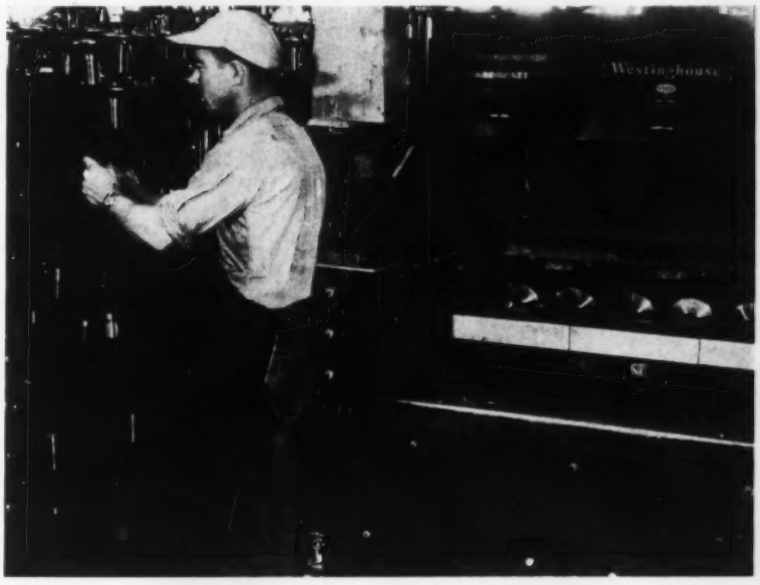
This automatic induction heater prepares heads of partly finished automotive valves for upsetting. In an hour, it heats 1800 of the parts to 2100° F

190 lb before they're forged into 8 in. shell blanks. Two horizontal, hydraulic, pusher type machines feed billets in a continuous line through the heating coils at a rate of 14.2 tons per hour.

Seven temperature levels are maintained in a 20 ft long induction heating area that keeps billets at the right temperature during standby periods. Forging can be resumed immediately after a short shutdown.

Total cost of the setup is $317,300; operating cost, exclusive of labor, is $46.64 an hour.

At one plant, a power system supplies 6000 kw at 960 cycles, and 7650 kw at 60 cycles, to six billet heaters — horizontal, hydraulic, pusher type. The system heats 40 tons of 8 by 3½ in. billets an hour, feeding six 105 mm shell forging press lines. The heating system cost $1,056,616; operating cost, exclusive of labor, is $152 an hour.

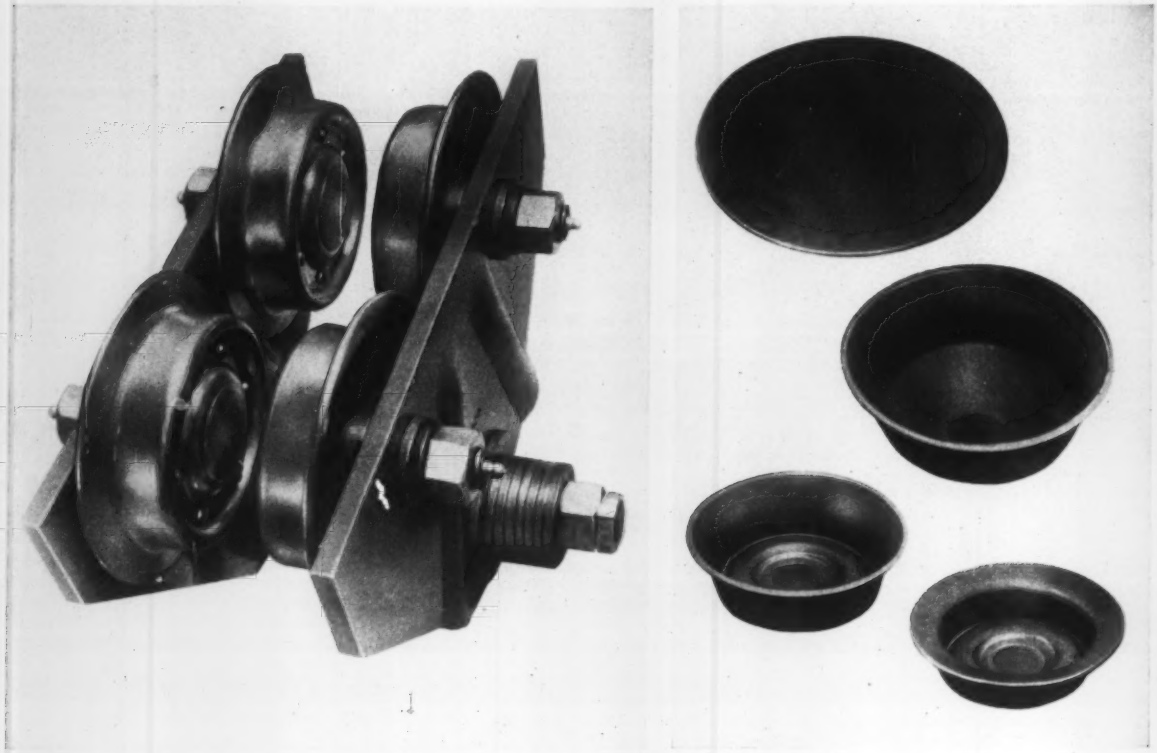


Auto axles are taken from the conveyor and placed in the induction hardening machine. Better heat treating cuts costs through use of less expensive steel

• **Low Frequency Heating** — The lowest induction frequency—60 cycles—is often used to heat nonferrous bars and billets, 5 in. or more in diameter, for extrusion.

Typical is a unit used in a number of aluminum plants to heat billets, 6 in. OD, 8 to 36 in. long. The heater costs about $50,000. It heats billets to 900° F, at the rate of 5000 lb per hour. Power cost, at 1 cent per kw-hr, is about $6.40 an hour.

Low frequency equipment is also being considered for heating copper wire bars before they're rolled. Available equipment will heat a 250 lb bar to 1750° F in only 2 minutes. It can be purchased for $270,700, and operated for $22.92 an hour, exclusive of labor.



Beryllium copper wheels eliminate sparking on this chain hoist trolley. Wheels are made from Berylco 25 alloy strips. A 75 ton press forms the blanks

Beryllium Copper Eases Trolley Fire Hazard

This nonsparking material has good electrical conductivity, high strength, corrosion resistance, and wears as well as steel. Most processing can be done with same tools

LOOKING for a satisfactory nonsparking material? Consider beryllium copper. It was selected for use in hazardous atmospheres by Saginaw Products Corp., Saginaw, Mich.

• **Problem**—Saginaw has material handling equipment in the vicinity of paint spray chemical treatment, and explosive manufacturing facilities. Sparks from steel trolley wheels on overhead conveyors or chain hoists could cause a fire.

In its search for a nonsparking material, the company eliminated fiber wheels (low heat resistance); brasses and bronzes (too soft); and aluminum (corrosion). Some stainless steels had the necessary wear and nonsparking properties but were difficult to form.

• **Solution**—Saginaw chose beryllium copper for a complete line of trolley wheels. It is used for the outer shell of the wheel, which serves as a wearing surface and as a separation of the steel components from the steel track.

• **Why?** — Beryllium copper has good electrical conductivity, high strength, and wears as well as steel. In addition, it may be processed with basically the same tools as steel.

The Berylco 25 alloy has these properties: Tensile strength, 165,000 psi; elongation, 5 per cent in 2 in.; hardness, 36 Rockwell C; electrical conductivity, 22 per cent minimum.

• **Fabrication**—A 60 ton blanking press punches out flat discs from the beryllium copper strips (0.097 and 0.120 in. thick). A 75 ton press forms the blanks into a bowllike shape. Four to eight forming steps may be required.

Hardness is developed by heat treating. Saginaw's usual treatment is about 3 hours in a gas fired oven at 600° F. Following blasting with G-40 malleable grade shot, parts are ready for assembly.

Paper Wipers Ease Recovery of Metals

Precious metal processor burns discards, then melts the chips recovered from the ashes

SAVINGS of up to $1000 a month are being realized at a west coast plant in the recovery of precious metals from incinerated paper wipers.

Wilkinson Co., Santa Monica, Calif., produces dental alloys, and metals for transistors, semiconductors, and electronic tubes. Recovery of such metals as gold, platinum, and iridium has substantially reduced the company's expenditure for new metals.

After discarded wipers have been burned, the ashes are lowered into a furnace where the metal is liquefied. Collected as "buttons," alloys of the metals are worth $20 to $100 an ounce.

• **Wiping Problems**—Before the recovery program was installed, the firm used cloth wipers. The precious metal particles were lost when they were discarded, making a sizable dent in Wilkinson profits.

Also chips on re-used rags damaged many of the products in manufacture, and lint from the cloths clogged dies for fine wire drawing operations.

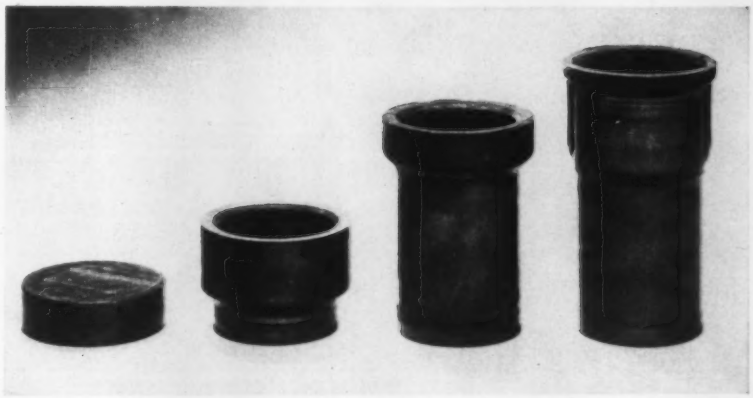
• **Paper Wipers**—The lintless paper wipers (made by Scott Paper Co., Chester, Pa.) were found to be safe for cleaning ribbons of precious metals used in the manufacture of the various dental and electronic products.

The uniformity of size and the nubby textured surface of the paper wipers are advantageous for cleaning milling machines where orthodontic bracket material is slotted.

The embossed paper used for the wipers has thousands of tiny reservoirs for soaking and holding oil. The special paper also has high cross-directional stretch which gives it strength in all directions to resist tearing. That property permits vigorous use of the wipers over rough and irregular surfaces.

Cases of Scott wipers are kept in the stockroom at Wilkinson and individual boxes are distributed to employees as they are needed.

Impact Extrusion Cold Forms Chrome-Molybdenum Steel



A 6 in. can is made in three steps, starting with 1-1/16 in. slug. The cold forging process is said to be competitive with other production methods. Eight advantages are cited

ALLOY STEEL is being impact extruded (cold forged) by Matthews Mfg. Co., Hawthorne, Calif. Pressures are three times the maximum specified for a tool steel grade. Such performance depends a lot on tool design, heat treating, machining, and lubricants.

A typical application is a closed end steel can, which is made for the Navy.

• **Process**—Impact extrusion offers these advantages:

1. Close tolerances.
2. Inexpensive tooling changes.
3. Part strength.
4. Complex configurations.
5. Good surface finish.
6. Economy.
7. High volume runs.
8. Design freedom.

• **Tool Design** — Different punch and die assemblies were designed for the three operations. AISI D2 tool steel from Bethlehem Pacific Coast Steel Corp., Los Angeles, was selected. Generous radiuses were used on corners. After machining, the die assemblies were heated, air quenched, and double drawn. After grinding, the finished tools were again drawn and air quenched .

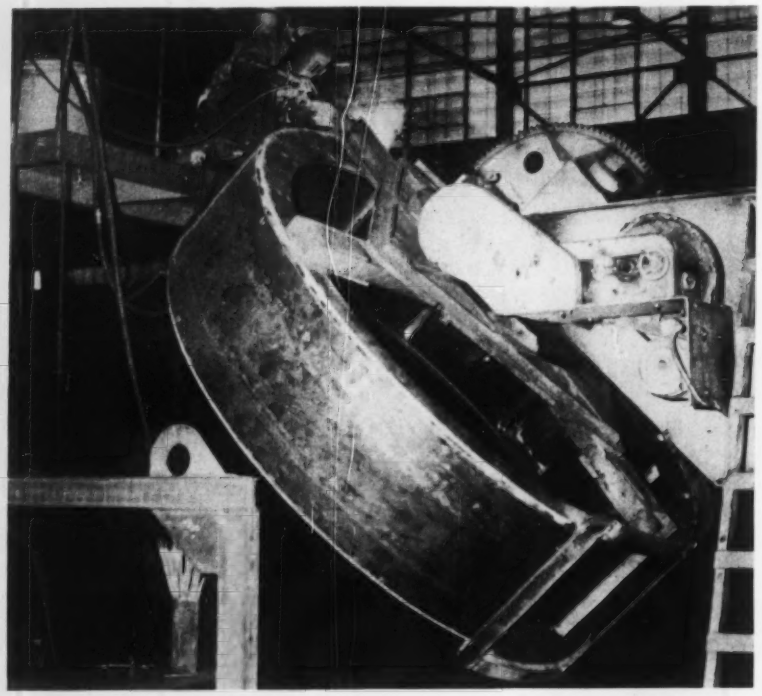
A Rockwell C hardness of 60-62 was obtained. Compressive yield strength was about 20 per cent above normal (about 600,000 psi).

Matthews believes the tool steel can form 150,000 to 200,000 pieces. A tool used to produce a shape by hot working was estimated to form only 5000 pieces.

• **Forming**—Slugs in 1 5/16 in. sections were cut from 3 5/16 in. 4130 chrome-molybdenum steel rounds, then softened with a normal pack anneal. At about 150 tons per sq in., the steel flowed upward, in a backward type extrusion through the space between the punch and die. Mechanical stresses were relieved by drawing after each forming operation.

• **Lubrication** — After each operation, the part is pickled in sulfuric acid, rinsed in cold water, and coated with zinc phosphate heated to about 135° F. The zinc phosphate is neutralized in a solution at 130° F, and the part is lubricated with a soapy substance at 160° F. Zinc phosphate is a reactive type lubricant that adheres to steel.

The completed can has a yield strength of 120,000 psi.



Nearly completed fan casing is held upside down on a positioner which allows operator to work downhand. Platform, which can be raised or lowered, holds operator and equipment

Semiautomatic Welder Boosts Production

SEMIAUTOMATIC welding cut production time 25 per cent for Combustion Engineering Co., St. Louis.

The job: Heavy fan casings for powerplant blowers. (They provide the blast which burns powdered coal in high pressure boilers.)

The material: ½ in. to 1½ in. mild steel plates.

Other advantages, says Combustion Engineering: A 25 per cent increase in the amount of metal deposited per pound of wire and greatly reduced postweld cleaning time because of lower spatter.

• **Operation**—Casings are assembled, tackwelded, and mounted on a positioner. The operator and welding equipment are on a platform—it can be raised or lowered. Benefit: The operator can make all welds in the flat position for greater efficiency.

Combustion Engineering uses 3/32 in. wire in a Unionarc welding machine set at 400 amperes of direct current (reverse polarity).

Two passes are usually adequate to make an outside corner weld.

• **System** — Unionarc, made by Linde Co., a division of Union Carbide Corp., New York, is one of several semiautomatic systems which have been showing big gains in some areas of joining. It uses a continuously fed wire electrode which is magnetically coated with flux as it is fed into the hand-held nozzle. CO_2 is used for shielding.

The torch can be used in all welding positions and in many cases travels three or four times faster than conventional covered electrodes.

Mandrel Drawn Tubing Lops 75-80% Off Cost

IF YOU can substitute mandrel drawn steel tubing for honed tubing, your savings may match the 75 to 80 per cent cost reduction reported by Gabriel Co., Cleveland, which uses 2 million ft monthly.

Gabriel makes direct acting automotive shock absorbers. Originally, honed tubing was the only type that could meet specifications. It is used as the innermost cylinder and contains a piston and hydraulic fluid. Piston compression and rebound strokes compensate for road variations and are cushioned by the hydraulic fluid. The inside walls of the cylinder must have a mirror smooth surface. Blemishes or rough spots can damage the piston and rubber seal.

Another requirement: Close diameter tolerances have to be maintained under operational stresses. If diameter variations develop, binding or loosening of the piston will render the shock absorber useless.

Gabriel now uses a special, smooth, mandrel drawn tubing made in 15 ft lengths by Jones & Laughlin Steel Corp., Pittsburgh. Inside diameters range from 0.995 to 1.001 in. Outside diameters range from 1.082 to 1.085 in. As received, lengths are cut into 7 to 11 in. sections. Ends are deburred.

Floor Grating Aids Safety, Maintenance, Drainage

Electroforged floor grating provides manifold benefits for Dow Chemical Co., Midland, Mich. Sprinkler coverage is extended through floors, fewer sprinkler nozzles are required, and safety and maintenance problems are eased.

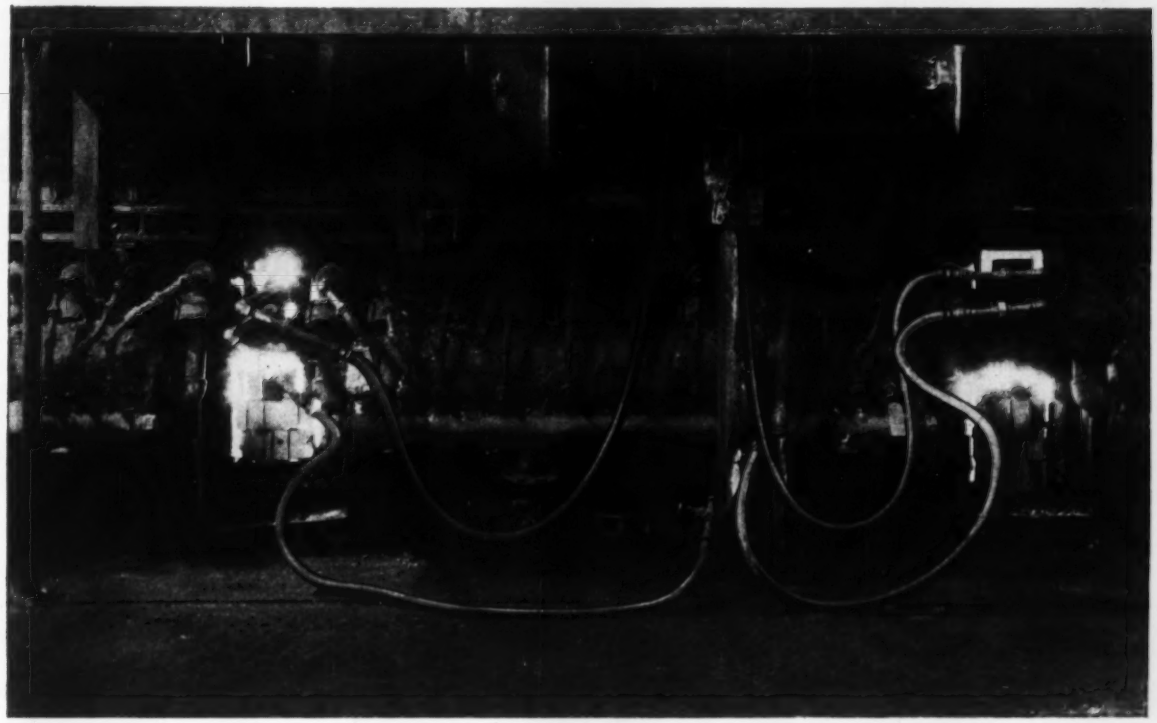
Several hundred thousand square feet of 1 x 3/16 in. grating (made by Blaw-Knox Co., Pittsburgh) provide sure footing.

Snow and ice do not accumulate and drainage problems are simplified. Because fewer drainage lines are needed, construction costs for Dow's outdoor processing stations have been reduced.

Electroforging has also eliminated corrosive attack of joints. Almost 600 kinds of chemicals are processed at Midland.

PEERLESS WATER HOSE

BIG STEEL MILL DEPENDS on U.S. PEERLESS WATER HOSE to prevent pipe skid burn



In the Fretz-Moon furnace of this Kaiser Steel Mill in Fontana, Calif., one length of U.S. Peerless® Water Hose ("the hose with the good brown cover") carries cold water to the pipe skids, another length carries the return hot water—up to 200° F. If the hose should fail or kink, the pipe skids would burn up and costly repairs and downtime would follow.

Kaiser Steel depends on Peerless to safeguard valuable skids and keep its pipe mill in operation. U.S. Peerless is part of the complete line of U.S. Rubber's industrial hose, engineered for use and abuse.

• • •

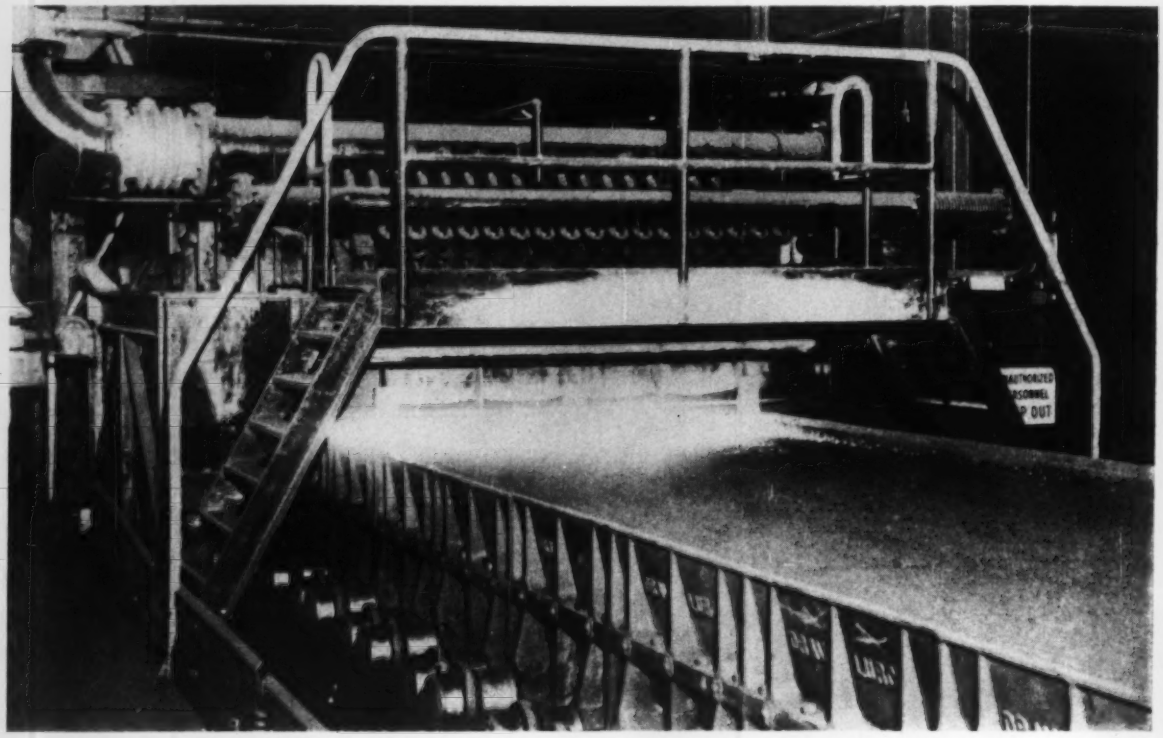
When you think of rubber, think of your "U.S." Distributor. He's your best source of on-the-spot technical aid, quick delivery and quality industrial rubber products.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.



Ore fines and flue dust, with crushed limestone as a flux and coke breeze as a fuel, are agglomerated under intense heat on this 111 ft sinter strand. A gas furnace ignites the coke; 13 windboxes help fuse the mix

McLouth Joins Trend: Builds Self-Fluxing Sinter Plant

The facility turns out 2100 tons a day. Limestone is incorporated in the mix, meaning it doesn't have to be charged separately. Unit also reclaims flue dust

STEELMAKERS are intrigued with self-fluxing sinter as a blast furnace feed. (It eliminates the need to charge limestone separately.) Several companies are building plants to produce the material.

One of the newer plants, put into operation recently at the Trenton (Mich.) Works of McLouth Steel Corp., turns out 2100 tons of self-fluxing sinter daily. It was built by Dravo Corp., Pittsburgh, under a licensing agreement with the Lurgi Co., Germany.

Designed to agglomerate Lake Superior ore fines which are too small to be fed into blast furnaces, it will also reclaim a five year accumulation of flue dust (about 300,000 tons) with a high iron content.

• **The Furnace** — The continuous strand sinter machine is equipped with a hearth layer system and a roll feeder for the sinter mix. Also included: A pallet tipping wheel, an adjustable drive train, and a sinter breaker.

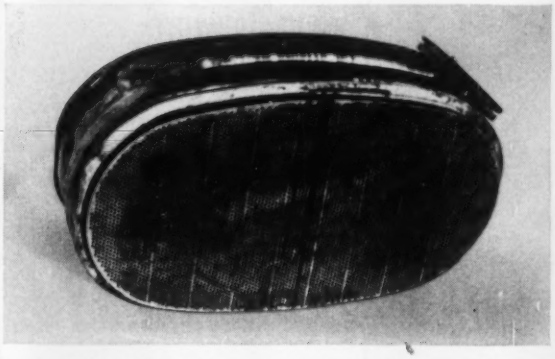
The ignition furnace is welded steel with a rammed refractory lining. A row of gas burners provides up to 120,000 Btu per hour for each ton of sinter produced.

A water cooled jacket protects the bottom of the unit; water cooled, adjustable gates prevent leakage at the ends.

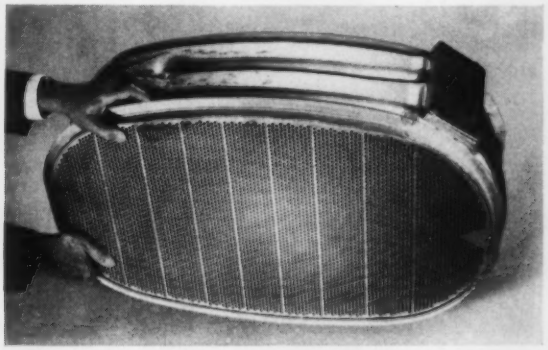
Mounted on a structural steel carriage, with wheels that run on tracks parallel to the strand, the furnace is easily accessible for repair or replacement.

• **Materials Processed**—Ore from the storage yard is delivered to three bins, which feed it to a 60 ton surge hopper by conveyor. It's then carried by a vibrating feeder to a vibrating screen that removes ore over $\frac{3}{8}$ in. for direct feeding to blast furnaces. Smaller particles are carried to storage bins that feed the sinter mix belt.

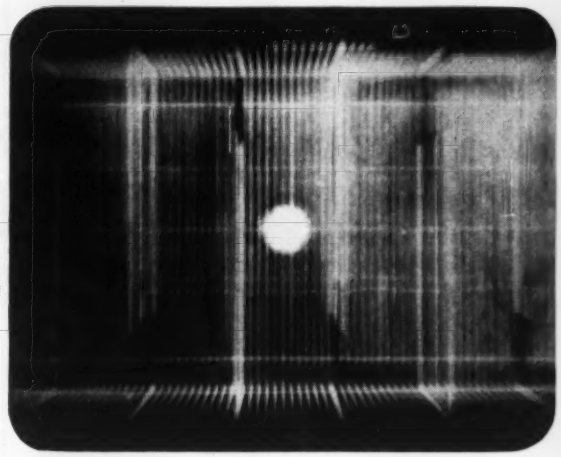
Coke, flue dust, crushed limestone, and mill scale are transferred from railroad cars to a surge bin,

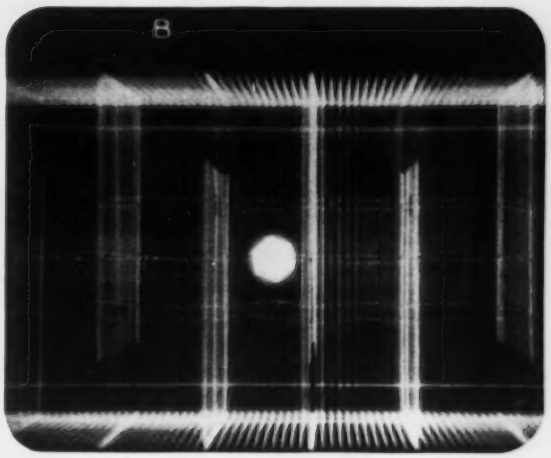


An oil cooler as it comes from the airplane engine. Radiograph below shows accumulations of sludge and dirt on the tubes.



After cleaning, the oil cooler is ready to return to its job. Radiograph below shows dirt gone and passages unrestricted.





To keep an engine's bloodstream clean

OIL COOLERS are vital to today's aircraft engines. At overhaul time they must go back on the engine clean as new. No minute particles of carbon or metal can remain to be a threat to the renewed engine. Cleaning them has become a specialty with SMS Instrument and Accessories Corp. of Idlewild Airport, N. Y. C.

To show that each cooler they clean is free of debris, it is sent to Industrial X-ray Incorporated, New Hyde Park, New York, to be radiographed. And when the cooler goes back to its job, its x-ray certificate of cleanliness goes with it.

In such inspections of assemblies, in quality control, in nondestructive testing, radiography provides a means of "seeing" internal conditions and also a lasting record of what is seen.

Producers of castings, and makers of welded products, find radiography a means of expanding their business and making sure only high-quality work is delivered.

Would you like to learn how it could help you? Contact your Kodak x-ray dealer or the Kodak Technical Representative to talk it over.

X-ray Division . . . EASTMAN KODAK COMPANY . . . Rochester 4, N. Y.

Read what Kodak Industrial X-ray Film, Type AA, does for you:

- Speeds up radiographic examinations.
- Gives high subject contrast, increased detail and easy readability at all energy ranges.
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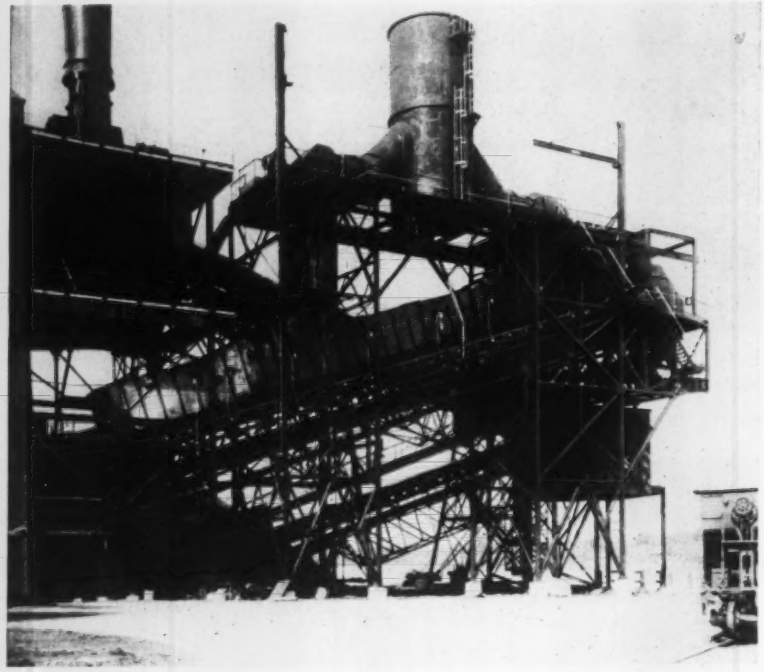
Kodak



Straight line, induced draft cooler reduces temperature of sinter from 1450 to 235° F. Material can then be handled by rubber belt conveyors

then fed to a 1 in. vibrating screen. Material over 1 in. is discarded; smaller particles are stored in the sinter plant feed bins.

Coke breeze under 1 in. is taken to an air blown rod mill, where it's crushed to less than ⅛ in. It's then stored for addition to the sinter mix.

Table feeders, under the storage bins, carry materials to the sinter mix belt. Co-ordinated scales on the conveyors indicate the weight of ferrous materials delivered to the belt and add the right amount of coke to the mix.

Another conveyor scale indicates weight of the sinter mix after water has been added in a pug mill. Material is then pelletized and stored in surge bins that feed the sinter strand. The feed rate is correlated with machine speed.

Sintered material ⅜ to ¾ in. in diameter, placed on the grate bars of the sinter machine, forms a bed 1 to 1½ in. deep for the pellets.

• **Grading and Cooling**—At the end of the sinter strand, a breaker reduces the product to chunks 6 in. or less in diameter. A vibrating screen removes sinter under ⅜ in. It's stored and later returned to the sinter mix belt.

Sinter ⅜ to 6 in. in diameter is transferred by a vibrating feeder to a straight line cooler, the first of its kind installed by Dravo in the U. S. Equipped with two large, axial flow fans, it reduces the temperature of the sinter from 1450 to 235° F. The material can then be handled by rubber belt conveyors.

After cooling, sintered material passes over a series of screens. Pieces over ¾ in. are used as blast furnace feed.

Part of the ⅜ to ¾ in. sinter is used as a hearth layer, and the rest is used in the blast furnace charge. Material under ⅜ in. is returned to the sinter mix belt.

• **Others Installed**—Earlier, Dravo built a sinter plant at Ashland, Ky., for Armco Steel Corp. (See STEEL, Nov. 3, 1958, p. 78.) It produces 2400 tons of sinter daily.

Two plants, said to be the largest in the world, are being built by Dravo for United States Steel Corp., at Saxonburg, Pa., and Gary, Ind. Each will make 15,000 tons of sinter a day.

Strong Polyvinyl Film Resists Corrosion, Weather

A new polyvinyl fluoride film (Type R) with outstanding weathering characteristics, chemical resistance, and mechanical strength has been made available by E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. Early laboratory samples of unsupported film have not embrittled or discolored after ten years' exposure. Predicted life as a film finish on laminates is double that of unsupported film.

Excellent resistance is shown against 10 per cent sulfuric acid, 10 per cent sodium hydroxide, and carbon tetrachloride. The nonplasticized transparent film exhibits high tensile strength and flex life. Usable temperature span ranges from −100 to 250° F.

The dielectric constant is 7.5 at 68° F and 60 cycles. Dielectric strength and resistance to thermal degradation is high.

It can be vacuum metallized, thermoformed, and is postformable in laminations to plastics, metals, and other materials. Glossy and satin finished types are available.

Long outdoor life coupled with easy forming and fabrication make the film suitable for surfacing siding, roofing, and other building products.

Glass, Plastics Reduce Missile Weight, Insulate

New structures and materials for missile nose and exit cones, fuselages, and other space vehicle structures are said to provide a 20 to 25 per cent weight reduction, compared with conventional materials. The experimental units are fabricated from a blending of glass and plastics, says Hughes Aircraft Co., Culver City, Calif.

The nonmetallic materials have successfully withstood loading tests at high temperatures. Low rate of heat transfer (lower than metals) provides thermal insulation.

Other advantages: Corrosion resistance, high strength to weight ratio, and natural vibration damping (better than common structural materials).

When the Blast-Off Is the Pay-Off . . .

WHEN your critical project goes on the line it is a virtual prisoner of its components. Whether your's is a missile, or a more utilitarian product, failure of just one part means failure of the whole project.

Seamless and welded stainless steel tubing backed by Wall Tube's depth of experience in metals, manufacturing and testing will free you from failure by this component, whatever its application.

Wall Tube specializes in the manufacture of small-diameter tubing for the most demanding applications. Its quality control lab is equipped to do the most exhaustive testing. Its Technical Sales Representatives are eager to assist in the selection of your metal requirements. Modern facilities enable delivery of the job as it was promised.

If you haven't drawn on Wall Tube for your tubing needs, you've been denying yourself of a capable, dependable and economical source. We invite your inquiry.

RANGE OF MANUFACTURE:

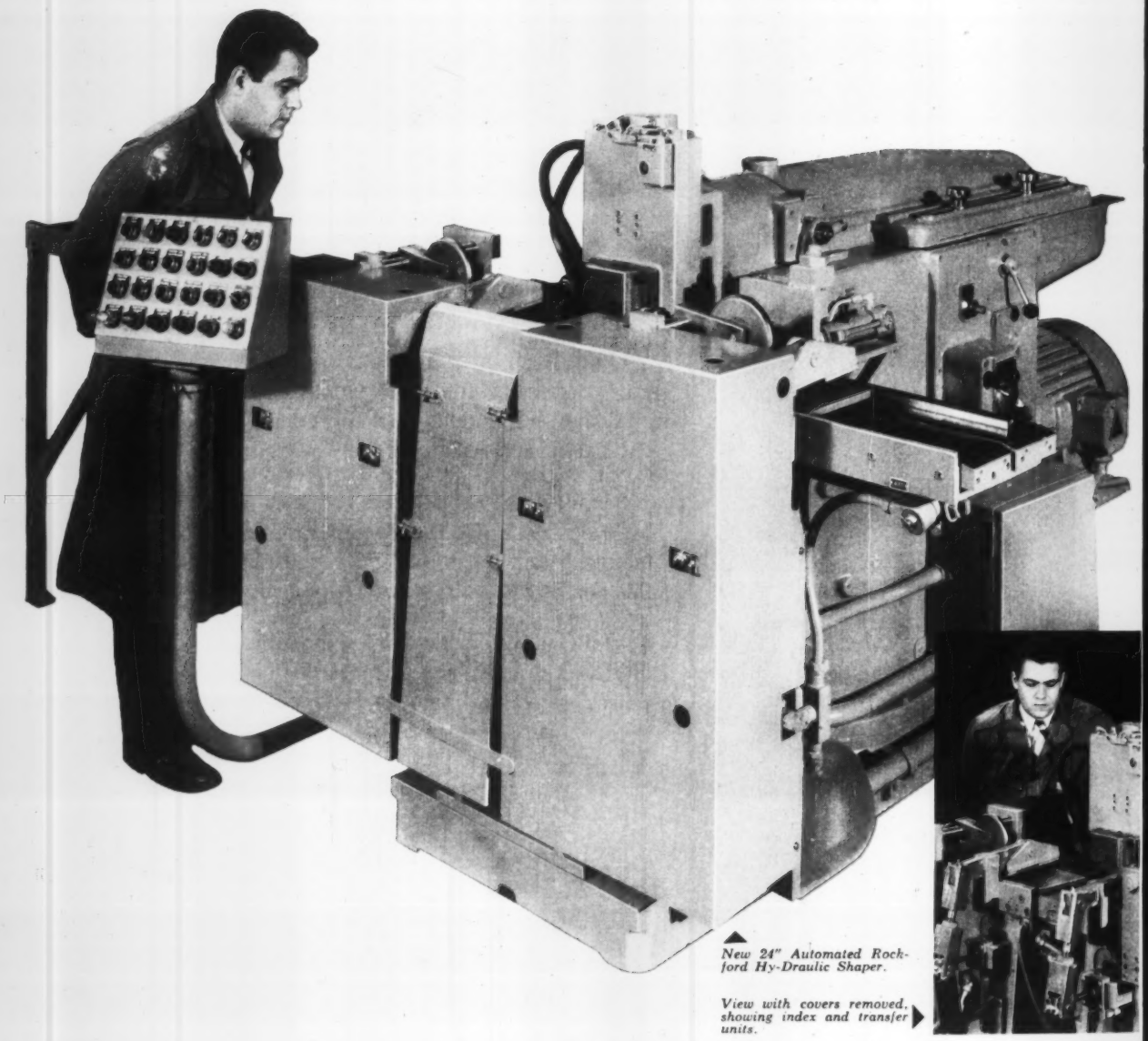
Welded and Cold Drawn
1 1/8 OD to 3/32 OD
.083 to .008 walls

Seamless
5/8 OD to 3/32 OD
.049 to .008 walls

In Tubing for the Space Age . . . this name counts . . . . . .

WALL TUBE AND METAL PRODUCTS CO.

Now... automation comes to shaping!

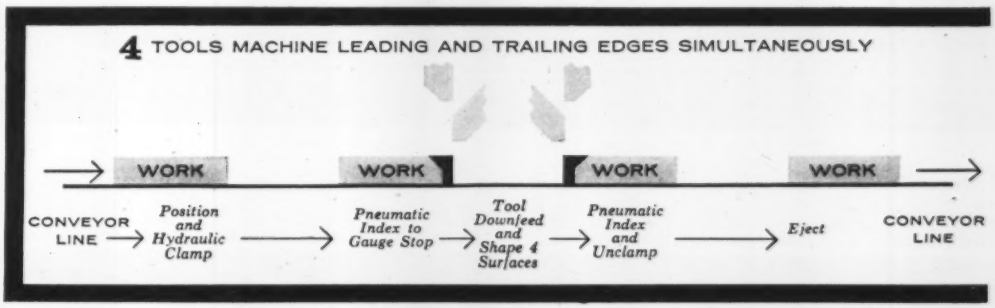


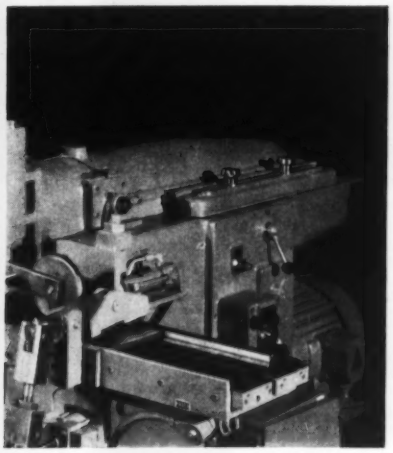
▲ *New 24" Automated Rockford Hy-Draulic Shaper.*

View with covers removed, showing index and transfer units. ▶

COMPLETE AUTOMATIC CYCLING ON ROCKFORD

HY-DRAULIC SHAPER PRODUCES CONTINUOUS FLOW OF PARTS FOR CONVEYOR-LINE PRODUCTION . . .





Believed to be the first automatic shaper built, this standard 24" shaper with special tool head and cross-rail has been adapted to conveyor-line operation by arranging completely automatic cycling, including loading and unloading.

With this new method, many types of flat plates may be machined accurately and efficiently at high production rates, saving costly cutting tools and extra fixturing expense.

Four standard high speed steel tool bits with identical grinds are used to finish one vertical and one angular surface of each of 2 pieces simultaneously, as shown in diagramatic sketch of the automatic cycle. The machine features pneumatic index, hydraulic positioning and clamping, and positive mechanical feed. Operation is continuous until machine is stopped by operator, or automatic safety devices reject the cycle sequence.

This type of automatic machining has many variations, using Rockford Hy-Draulic Shapers. If you have high output requirements for work which lends itself to this type of machining, send us blueprints for estimates and recommendations.

h
HYDRAULIC

ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

This wet vacuum sweeper scoops up flammable dust and chips and mixes them in 50 gallons of water. Sludge is removed daily

Wet Vacuum System Ends Flammable Dust Hazard

Magnesium casting producer reports a 25 per cent cut in cleanup manpower and a 33 per cent production increase after adoption of this equipment

ARE YOU faced with a flammable metal dust problem?

One solution: A wet vacuum system for dust and chip collection. It cut cleanup manpower costs 25 per cent and increased production 33 per cent for a magnesium and aluminum aircraft casting maker.

• **Case History**—Dust from magnesium grinding operations presented a persistent hazard at Arlington Texas Industries Inc.'s plant at Arlington, Tex. One spark could initiate a chain reaction fire in the finely divided material. Shopmen were alerted, but cleanup methods using air vents, brushes, and shovels were ineffective.

One disastrous fire caused more than $100,000 damage. Following a second fire, an investigation was started.

Housekeeping methods were a production handicap. Machine stoppage for cleanup reduced output.

To lick the problem, Arlington tried a 5 hp, portable vacuum cleaner (Wetco-Vac) made by Air Appliance Div., U. S. Hoffman Machinery Corp., New York. Results: Labor savings, increased capacity, and no more fires. Night shifts are no longer necessary. Collateral benefits include less labor turnover and a cleaner, safer plant.

• **Equipment**—Staticproof hoses and nonferrous cleaning tools minimize sparking. Incoming dusts are thoroughly mixed into the unit's water tank. Motor, starting switch, and electrical connections comply with NEMA standards for use where explosive dust is present.

New Technique Hot Rolls Titanium, Other Metals

A new fabrication technique hot rolls titanium, and other high strength metals. It was developed by Titanium Fabricators, Burbank, Calif. Rocket motor heads are typical products.

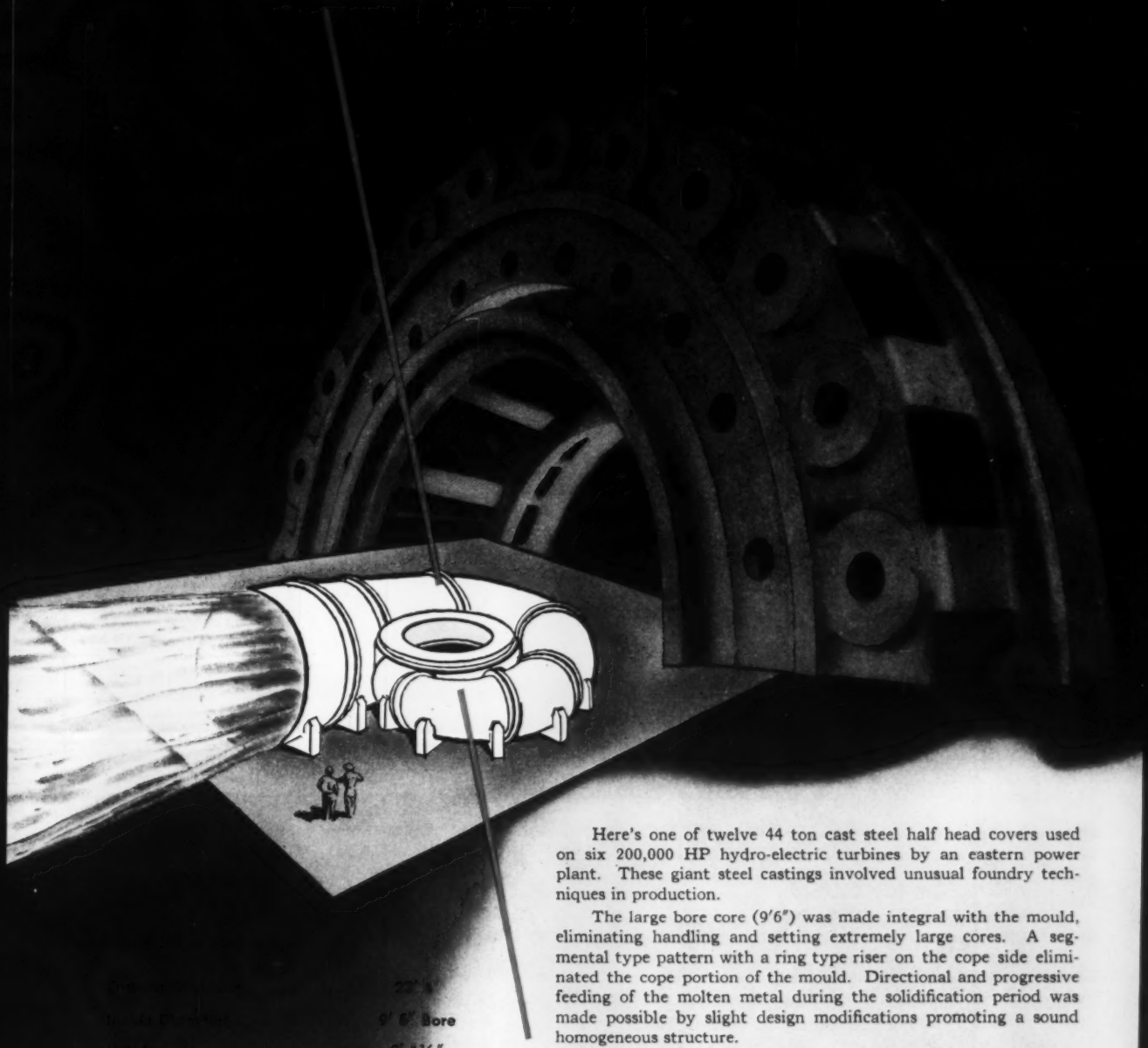
The hot spinning method reduces tooling costs by replacing normal deep drawing, forging, and cold shear spinning processes.

The parts are formed in one piece without welding. The head and case are continuous, and bosses can also be formed integrally with the heads. It means greater strength and material savings as high as 500 per cent for prototype parts, says the company.

Its hydraulic spinner deforms the metal by controlling heat and rate of forming and the amount of force used. This allows selection of the area least resistant to forming, while retaining the most desirable properties of metals when in the finished shape.

Diameters up to 120 in. can be economically made. Thickness is varied by moving the hydraulically controlled roller in and out as it passes different stations.

Cast Steel Harness for 200,000 Horses



	22' 6"
	9' 6" Bore
	5' 1¼"
Wt. of (Half) Head Cover	88,510 Lbs.
Wt. of Risers and Gates	93,000 Lbs.
Total Metal to Pour	181,510 Lbs.

Here's one of twelve 44 ton cast steel half head covers used on six 200,000 HP hydro-electric turbines by an eastern power plant. These giant steel castings involved unusual foundry techniques in production.

The large bore core (9'6") was made integral with the mould, eliminating handling and setting extremely large cores. A segmental type pattern with a ring type riser on the cope side eliminated the cope portion of the mould. Directional and progressive feeding of the molten metal during the solidification period was made possible by slight design modifications promoting a sound homogeneous structure.

After stripping, the castings were subjected to hydro-blasting and arc-air method for excavating surface imperfections. Finally, rigid dimensional inspection was followed by magnetic particle and radiographic examination at critical areas.

Here, at Erie Forge & Steel, experienced engineers, metallurgists and craftsmen control quality every step of the way from raw materials to finished steel casting. Consult with us on your steel casting and forging requirements.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

When you think
of product development
think of brass...
especially Western Brass...
it's "tailor-made" for each job.

Western
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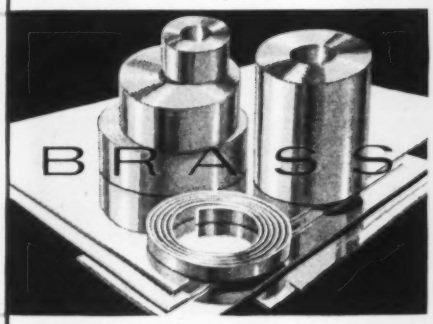

WESTERN IS A TRADEMARK

* Sheet and Strip Specialists in Brass and Copper *

THE MAN FROM WESTERN IS ONLY A PHONE CALL AWAY

OLIN MATHIESON CHEMICAL CORPORATION
Western BRASS

MILLS: East Alton, Ill., New Haven, Conn. • SALES OFFICES: Boston • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Decatur, Ga. • Detroit
Grand Rapids • Indianapolis • Long Island City • Los Angeles • Milwaukee • New Haven • Philadelphia • Rochester • Rockford, Ill. • Saint Louis

Ductile Iron Slashes Cost Up to 30%, Hikes Output

Ductile iron reduced spool cost 20 to 30 per cent and improved production at John A. Roebling's Sons Co., Trenton, N. J. The 60-45-10 alloy is cast into spools with 5 and 9⅞ in. diameters by T. B. Wood's Sons Co., Chambersburg, Pa.

Formerly, the 5 in. size was fabricated from high carbon (0.50 to 0.60 per cent) steel. Wire would snag in crevices where flanges join the spool barrel. This meant production delays, spool damage, and wire waste. Ductile iron, cast in one piece, ended snags.

The 9⅞ in. spools were cast from malleable iron. The lower yield strength of malleable made the spools vulnerable to rough handling damage such as nicked tension grooves and bent flanges. These difficulties have been sharply reduced with the use of the tougher ductile iron alloy, which has an essentially ferrite structure. Tensile strength ranges between 60,000 and 80,000 psi.

Rolling and Casting of Columbium Improved

Columbium mill technology has made a significant advance with the production of a 0.028 x 36 x 96 in. sheet. It was produced from a 9 in., 325 lb ingot melted by Universal-Cyclops Steel Corp., Bridgeville, Pa.

Another breakthrough: The casting of a 470 lb ingot of columbium containing 1 per cent zirconium. The alloy was melted from a 4 in. billet supplied by Wah Chang Corp., Albany, Oreg. The ingot is 8 in. in diameter, 36 in. long and will be remelted into a 12 in. diameter ingot for maximum purity and homogeneity. Corrosion resistance and low neutron cross section make it an ideal material for many nuclear parts. It is also being considered in the aircraft and missile industry for leading edges, nose cones, and skin material on supersonic vehicles.

Universal-Cyclops is developing commercial mill products of refractory and reactive metals and alloys for high temperature, high strength use in missile and nuclear industries.

This torque wrench is being checked on a Skidmore-Wilhelm calibrator. Wrench and calibrator reading should correspond

Bolt Torque Testing Pays Quality Control Dividends

This addition to a truck manufacturer's assembly program is insurance against user complaints. Gasket and cylinder leaks have been prevented

CONTROLLED bolt torquing in your assembly process can make customers happier and keep up the reputation of your products.

• **Case History**—White Motor Co., Cleveland, adopted the method as insurance against such things as leaking gaskets and cylinders and gasket blowouts. The method also disclosed weaknesses in previous checking methods.

White made a study of all connections in its trucks. Using information from the Society of Automotive Engineers, it developed torque standards for every type of bolt and screw used. Required accuracy in torque ranges from 30 to 1000 ft-lb for components and assemblies of its vehicles.

The next step was to hold the torque limits within a close range on the assembly line. To assure that proper torque was delivered to bolts, a torque wrench calibrator (made by Skidmore-Wilhelm Mfg. Co., Cleveland) was made a part of the daily inspection schedule.

The calibrator is moved from one station to another—operations involved include several lines (engine assembly, rear axle and differential, and front axle), dynamometer testing, and rustproofing.

Testing takes only a few seconds. The wrench is fitted into the coupling on the calibrator; torque is applied; and developed torque is indicated on a gage. The reading should correspond with the setting or reading on the torque wrench. Results are turned in to the inspection department every day.

CF&I

Reels
(500-800 lbs. capacity)

Disposable Spools
(5-70 lbs. capacity)

Fibre Drums
(250-600 lbs. capacity)

Standard Coils, paper-wrapped,
steel-strapped or wire-tied

WIRE . . .

PACKAGED for YOUR PRODUCTION

The CF&I Image represents the strength and dependability of all CF&I steel products. And for CF&I Steel Wire, this symbol reflects top quality. CF&I is the leader in designing packaging to reduce our customers' costs.

This is important to you! When you buy CF&I Steel Wire, you cut production costs—save time and money—by specifying the package that works most economically for you. You can choose a CF&I wire package that gives you the following special benefits:

- *reduced downtime through extra long lengths of wire*
- *simplified inventory control*
- *fast, economical in-plant handling*
- *continued cleanliness of the wire*

CF&I Steel Wire is available in a wide variety of gages and finishes. Whatever your wire requirements, be sure to order from CF&I. All orders—from a coil to a carload—will arrive at your plant packaged for your production. Let our nearest sales office know your requirements.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita
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CF&I OFFICE IN CANADA: Montreal
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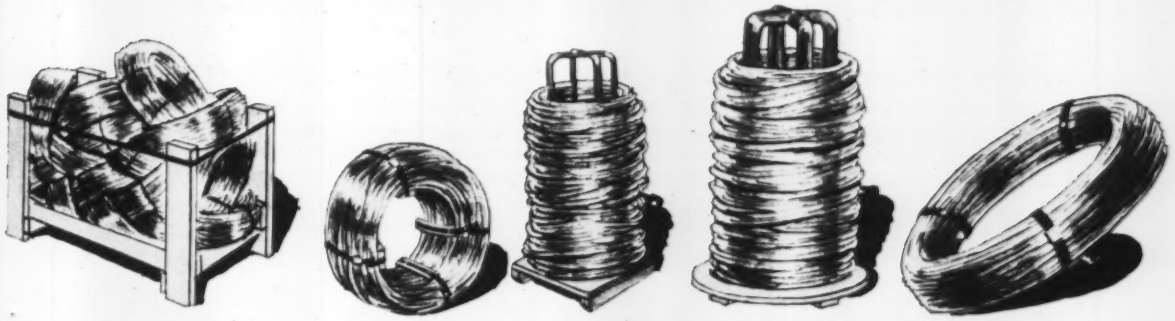
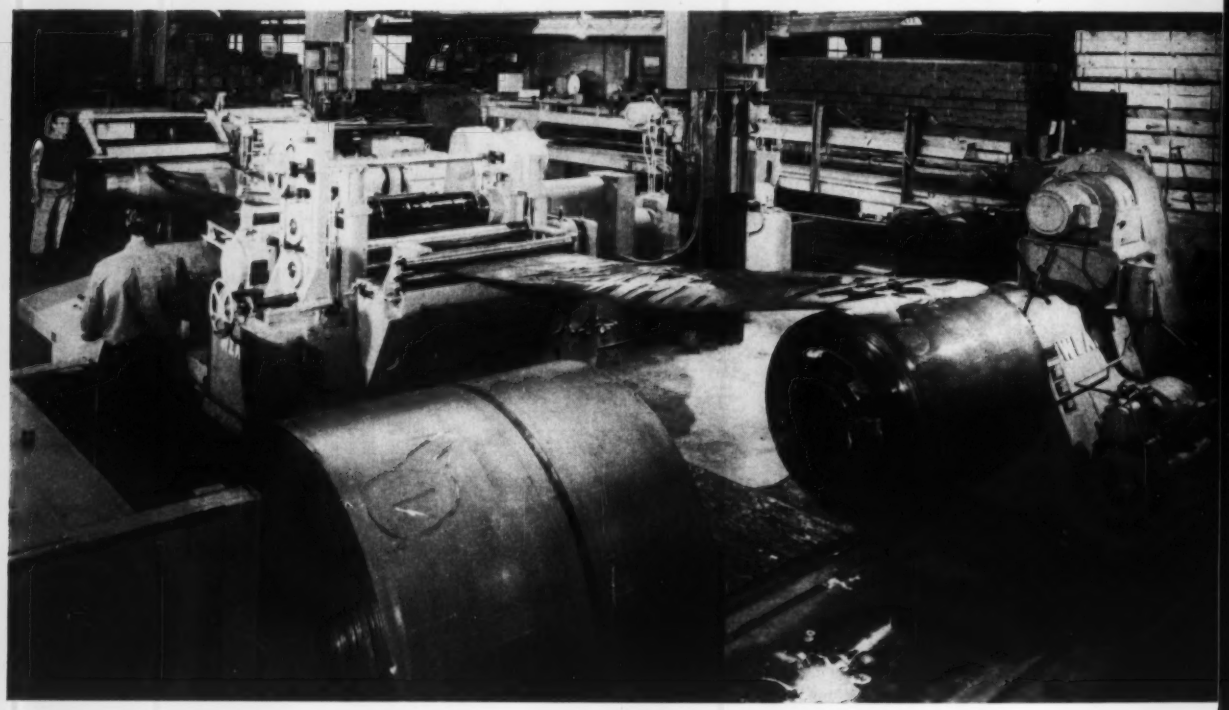


Steel-strapped Wooden Racks | Shaped Coils (1500-2500 lbs. capacity) | Stem-paks (500-700 lbs. capacity) | Returnable Spiders (2000-3000 lbs. capacity) | Steel-strapped Coils (100-600 lbs. capacity)

6626

Coil Processing Lines Cut Material, Labor Costs

Manufacturer of metal furniture does its own slitting and shearing to size. Result: Saving of 5 per cent in steel cost. Labor is eliminated in handling and resquaring of sheets

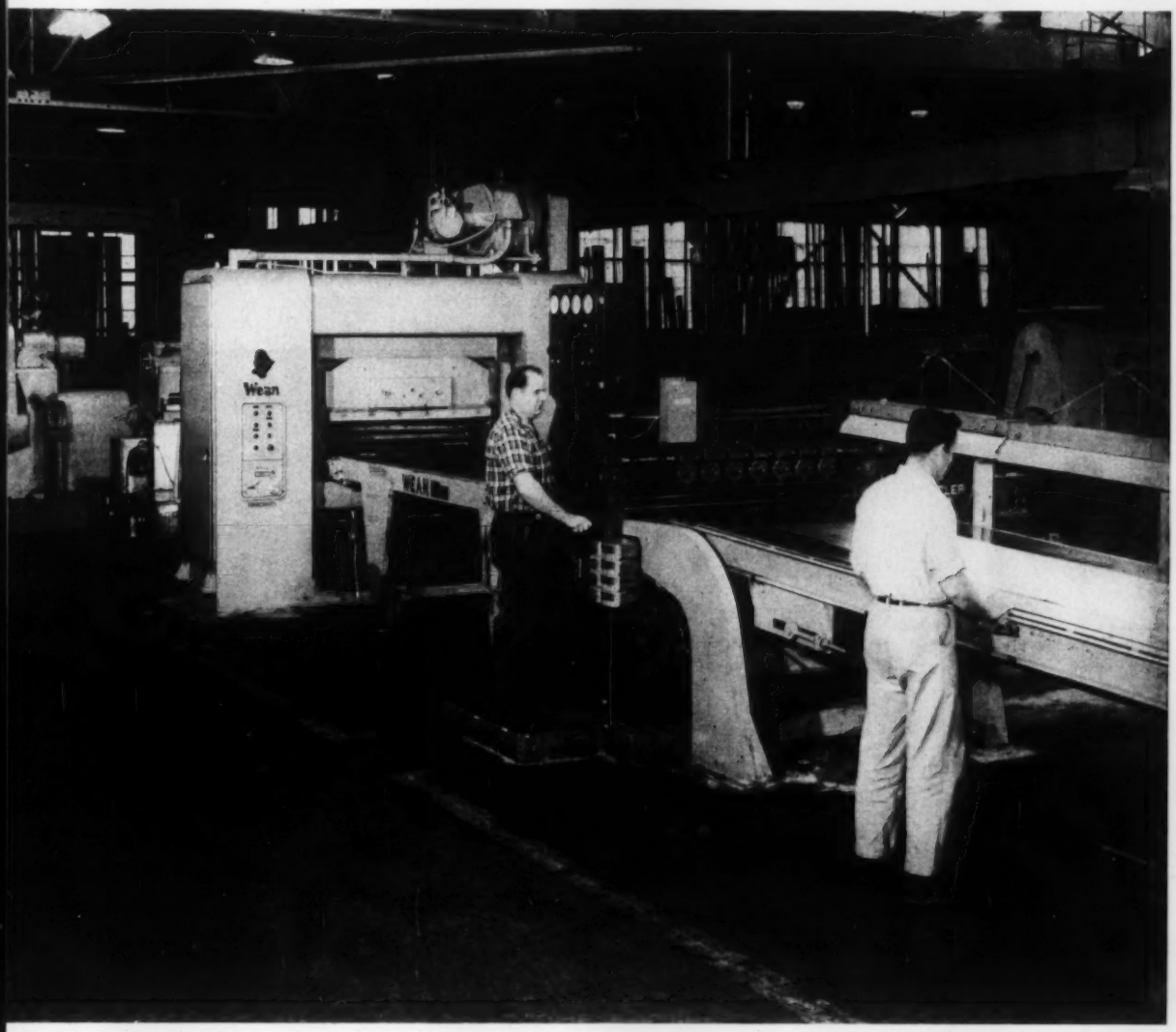


Slitting line consists of uncoiler, pinch rolls, slitter, scrap chopper, and recoiler

A 5 PER CENT saving in steel costs resulting from the utilization of a new coil processing system at General Fireproofing Co., Youngstown, will pay for the equipment in less than a year.

The manufacturer of metal business furniture feels that using the equipment to its capacity and including savings in handling and other labor costs may eventually provide total operating savings of up to 10 per cent a year over present costs.

• **Handles Major Volume**—The coil processing system consists primarily of a 48 in. slitting line and a 72 in. flying press shearing and blanking line. Wean Equipment Corp., Cleveland, built the two lines which take care of 95 per cent of the



Shearing line has uncoiler, flying press, leveler, inspection table, and stacker

plant's total steel needs.

After slitting, the strip is recoiled and moved by overhead crane to the uncoiler on the press line. It is cut to length on the press, then goes through a Voss leveler to an inspection table. It is stacked automatically. Cut lengths are trucked to the processing area.

• **Minimizes Handling**—The new press line saves additional money by eliminating a lot of handling. The company used to buy steel in sheet form (sizes from 24 x 112 in. to 45 x 144 in.). All of the steel had to be resquared, and about 80 per cent of it stretcher leveled.

Much steel was wasted in shearing, since odd lengths were left over. That problem is greatly reduced when coils are used.

• **Adds Flexibility** — General Fireproofing gained another important asset when it installed the new slitting line: It can slit the coils to whatever widths are needed. (Specifications in metal furniture manufacture change frequently.)

At a later date, shearing and blanking in one operation may be done on the Wean flying press. By equipping the press with dies which shape individual pieces in a single stroke while the strip is being cut, an intermediate stage can be eliminated.

• **More Savings Possible** — Engineers at the Youngstown plant emphasize that the 5 per cent saving in steel costs is conservative. It is based on use of strip widths between 23 15/16 and 35 15/16. If widths from 36 to 48 in. are found to be practical, additional savings will be realized.

The company also is studying a proposal to process aluminum coils on the same equipment. That would save an additional 5 per cent on the cost of that material.

Management at General Fireproofing feels it may eventually be more economical to have its Youngstown plant also process coils for its plants in other cities.

Atlas Steels' *26" 2-high reversing blooming mill*

speeds production under the **BIRDSBORO** *trademark*

And that trademark has come to mean quite a lot to steel producers in the U.S., Canada, Europe and other points on the globe. The strength and ruggedness demanded by the steel industry are blended with the advanced thinking and modern design ideas of the BIRDSBORO engineers. The result is productive and profitable mill machinery with a long, useful service life. The BIRDSBORO representative in your area can cite specifics. You'll find them very interesting. *Sales Department, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

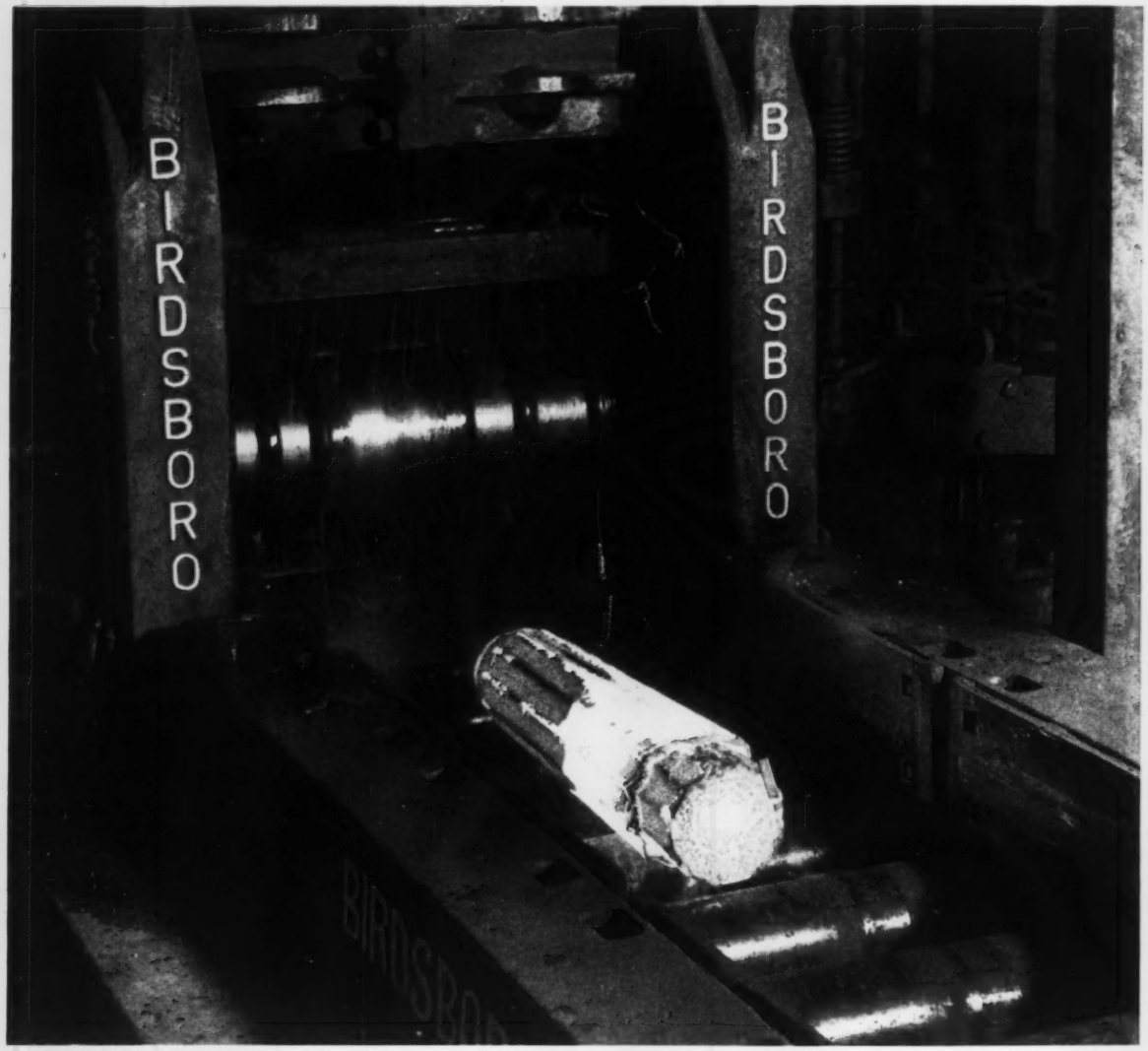


Photo Courtesy Atlas Steels Limited

MM-74-9

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

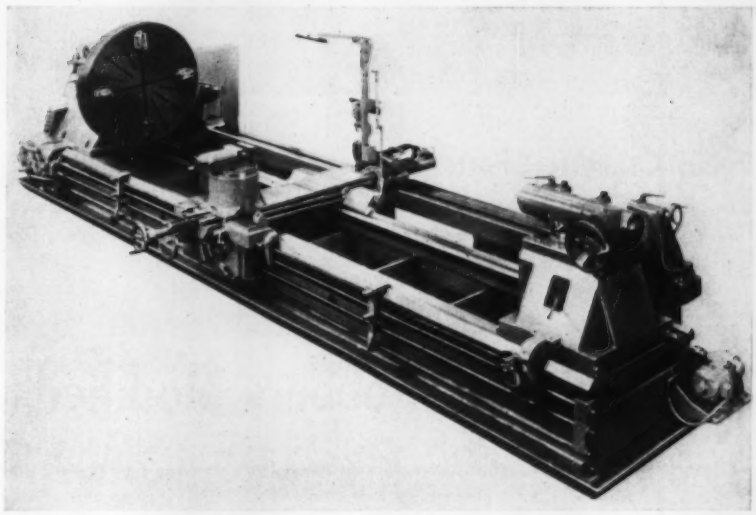
Lathe Machines Large Work with Precision

FABRICATORS of large parts for the rocket, missile, aircraft, and other industries can fulfill precision machining requirements with the Space-Master series of lathes.

The machines are available in swings up to 72 in. and center distances up to 50 ft. They can be purchased with or without the Sidney fluid tracer which permits use of flat or round templates. The tracer can be equipped with periscope mirrors, permitting observation of tracer and template from the front of the machine even with large diameter work in the lathe.

One of the features of the lathe series is a 16 spindle speed headstock equipped with lapped herringbone gears. The manufacturer says the herringbone gearing provides smoother operation, greater tooth contact, balanced gear loads, and longer gear life.

An important improvement over conventional lathe beds is the use of a separate rack for the tailstock pawl. All such parts as the tailstock base, carriage, bottom slide on the carriage, swivel on the bottom slide, and the top slide on the swivel, have unusually large support areas to prevent deflection.



Provision is made for rapid approach and withdrawal of tools. For more information *write* Sidney Machine Tool Co., Sidney, Ohio.

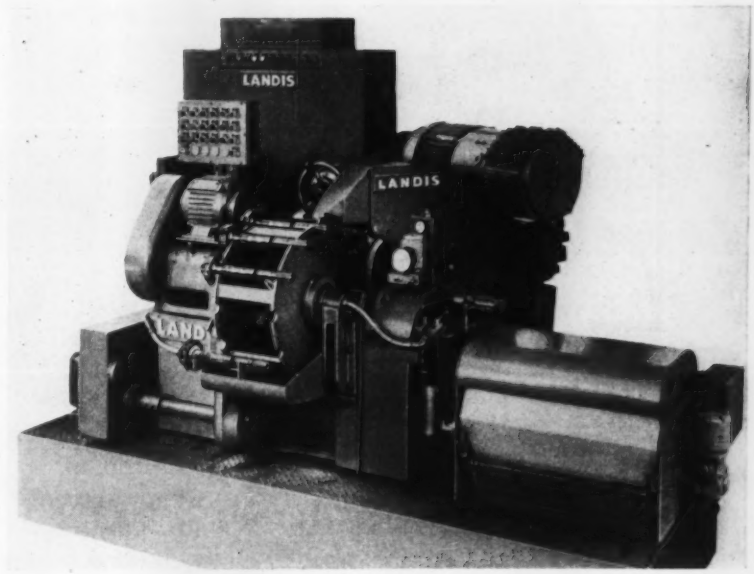
Cylindrical Grinder Finishes Multiple Diameters

BECAUSE it can utilize a formed grinding wheel, or several grinding wheels at once, the Landis R plunge grinder can grind a face and several diameters in one operation.

It is designed for production infeed grinding of cylindrical work with automatic operation. Says the builder: The machine makes it possible to grind to closer tolerances than possible before with a high production automatic grinder, practically eliminating scrap and rework.

Since the machine is for infeed grinding only, there is no swivel table or carriage. The headstock and footstock are mounted on columns secured to the front of the bed. That design makes it possible to use an automatic rotary type loader or a chute type loader for handling workpieces.

Introduced on the grinder is the



new Landis Microfeed wheel feed system (hydraulic and mechanical feed are combined). The outstanding feature of the system is its ability to duplicate its action for piece after piece. It will feed the grinding wheel in increments as small as 50 millionths of an inch.

For more information, *write* Landis Tool Co., Waynesboro, Pa.

Feeds Cylindrical Parts

FEED SPEEDS far in excess of conventional gravity methods are obtainable with the new Clark hopper feeder. It's accomplished through application of a continuous operating vane-type elevator that aligns and conveys cylindrical stock from the hopper, and a powered out-feed mechanism.

The unit feeds any cylindrical part or stock length bar or tube in steel, copper, brass, aluminum, fiber, nylon, and other materials. The feed mechanism is capable of conveying parts up to 20 ft from the feeder escapement to the operating machine.

The feeder converts manual or semiautomatic machines into automatic operation. Up to 7000 average length cylindrical pieces per hour can be fed into centerless grinders, automatic lathes, dial feed presses, forming machines, assembly devices, and similar equipment.

For more information, *write* Clark Industries, P. O. Box 314, Delaware, Ohio.

Coated Abrasives Give Up to 200% More Life

UP TO 200 per cent longer life, two to four times greater particle density, and more efficient cutting, compared with some older methods, are claimed for the line of Magnecoated discs.

Feature of the Magnecoating process is magnetic orientation of the abrasive particles so they are firmly

Gear Shapers, Hobbers Modified for U. S. Market

U. S. VERSIONS of the Lorenz line of gear shapers and hobbers, made in Western Germany, will be marketed by Michigan Tool Co.

An important modification includes U. S. electrical equipment and controls. All machines will conform to JIC standards.

They will bear the name Michigan-Lorenz.

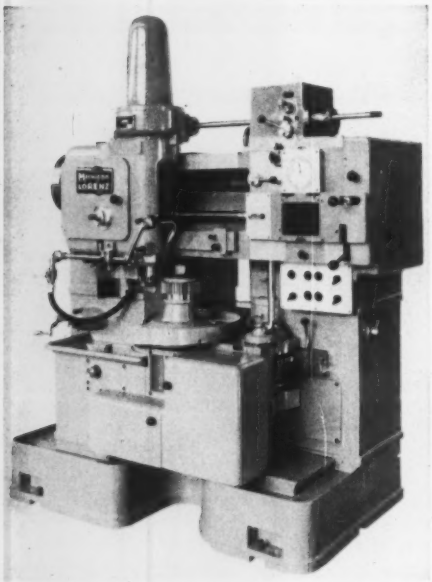
The gear shaper line comprises four models for gears up to 20 in. in diameter, two models for shaper cutting of closed gap herringbone gears, and a machine for cutting racks up to 6 ft long.

Two series of hobbing machines will be offered—medium capacity and large capacity. Two models for gear diameters up to 35 in. and 47 in. comprise the medium capacity series. Four models in the large capacity series cut gears up to 13 ft in diameter.

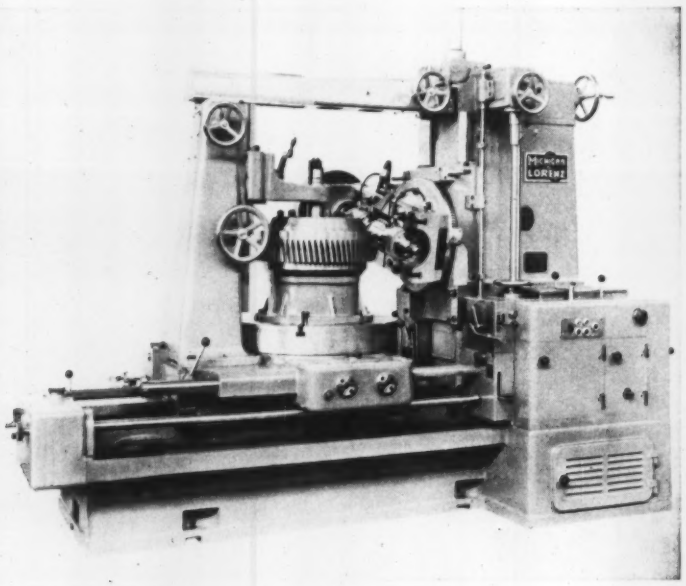
The Michigan-Lorenz gear shapers are intended for fully or semiautomatic production of spur and helical gears of both the internal and external types, racks, sprockets, and other special profiles.

All of the hobbers are single spindle type, for conventional and climb hobbing, including power infeed.

For more information, *write* Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.



SN-5 shapes gears up to 20 in. in diameter



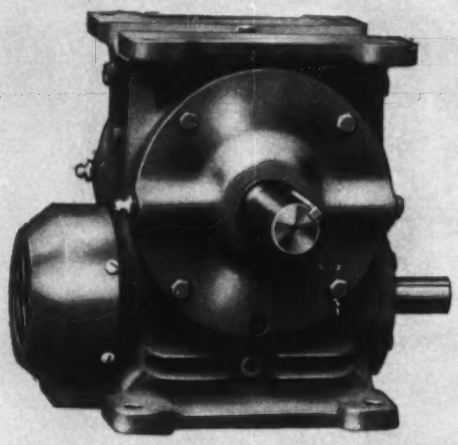
E-12 hobber machines gears up to 4 ft in diameter

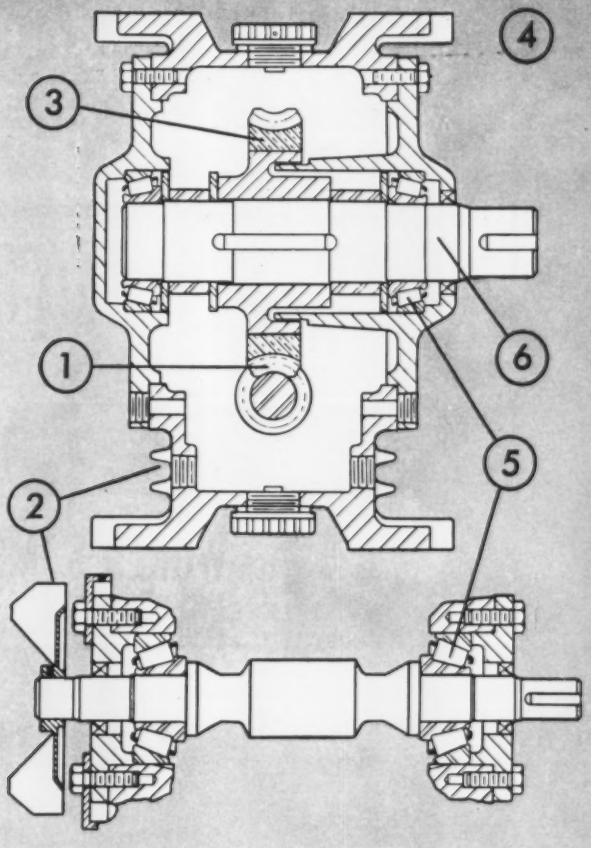
DELROYD

VERSO WORM GEAR SPEED REDUCERS

a new standard in worm gear design

smaller space and more horsepower per dollar





Make this value analysis NOW!

1. Involute helicoid thread form has highest load capacity of any type of worm gear.

2. Fan cooling and ribbed construction give maximum effect of heat dissipation.

3. Centrifugally cast bronze dished gear—dry well construction.

4. Unit may be mounted in any position. Alternate mounting surfaces.

5. Tapered roller bearings used throughout—provide maximum load capacity.

6. Heat treated alloy steel gear shaft with bearing and sealing diameters provide a strength of 185% of an untreated shaft of the same diameter.

Send for Catalog No. 5018

DE LAVAL *Steam Turbine Company*

860 Nottingham Way, Trenton 2, New Jersey

DL444

Unless you buy leaded steels directly from Inland's Indiana Harbor Works, chances are you've never seen this tag. But among Cold Drawers and Steel Warehouse men who process and sell leaded steels in a variety of forms to manufacturers, it is famous.

Every one of them recognize that behind this tag lies years of research, development and *unequaled experience*. Twenty years ago it marked the world's first commercial leaded steel. Today this tag represents the standard of performance by which all other free-machining steels are compared. It signifies LEDLOY* . . . the most machinable leaded steels obtainable.

INLAND STEEL CO., 30 West Monroe Street, Chicago 3, Illinois.

Get Inland Ledloy *steels in cold drawn form, sometimes sold under different trade names, from leading cold drawers and Steel Service Centers from coast to coast.*

AMERICAN STEEL WAREHOUSE ASS'N

*Reg. Trade Mark

This is

INLAND

LEDLOY®

WORLD'S MOST MACHINABLE STEEL

INLAND STEEL COMPANY

imbedded in the adhesive coating with the sharpest points upward. Excess loose particles are removed from the coated discs by magnetic force, leaving a clean, sharp cutting surface.

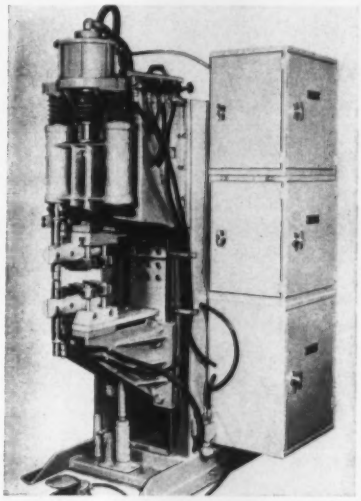
Discs are available in standard grits for all normal grinding and finishing operations.

For more information, *write* Abrasives Co. of America, 492 Main St., Ft. Lee, N. J.

Single Phase Welders Will Join All Metals

ALL WELDABLE metals, including steel alloys, aluminum, bronze, and magnesium, can be handled readily in the Electro-Weld universal welders.

With readily added controls, the single-phase resistance welders can duplicate the performance of three-phase welders in meeting most job specifications, says the manufacturer.



Features of the line include aluminum rams, a new lineal ball bearing sleeve, a heat vector up and down slope control, and a friction-free neoprene cylinder ring. Advantages claimed for the new lineal ball bearing sleeve include friction-free operation of the welding head, an ability to withstand the heaviest pressures, nonbinding, noninhibited ram performance, instant follow-up in controlling weld properties, and elimination of ram replacement or regrinding.

For more information, *write* Electro-Weld Div., Electric Arc Inc., 152-1 Jelliff Ave., Newark 8, N. J.

Crane, Hoist Motors

SMOOTH starts of heavy loads with increased safety and control are the advantages of the special Reuland motors.

Their high slip, high torque characteristics make them ideal for bridge, trolley, and hoist drives.

The motors are specially wound for use on material handling equipment.

They are available in ratings from ½ through 50 hp.

They can be ordered in frame sizes 182 through 365U, in drip-proof or totally enclosed designs.

For more information, *write* Reuland Electric Co., Alhambra, Calif.

Tracer Converts Machine For Contour Turning

CONVERSION of vertical turret lathes for contour turning within extremely close tolerances can be accomplished with the electronic-hydraulic Duplimatic tracer control attachment.

It permits internal and external contouring of hemispherical or irregularly shaped surfaces. Tolerances of ±0.005 can be held at 25 sfpm, ±0.0005 at speeds up to 5 sfpm.

The tracer unit in no way interferes with conventional operation of the machine tool.

For more information, *write* Tracer Control Co., 595 E. Ten-Mile Rd., Hazel Park, Mich.

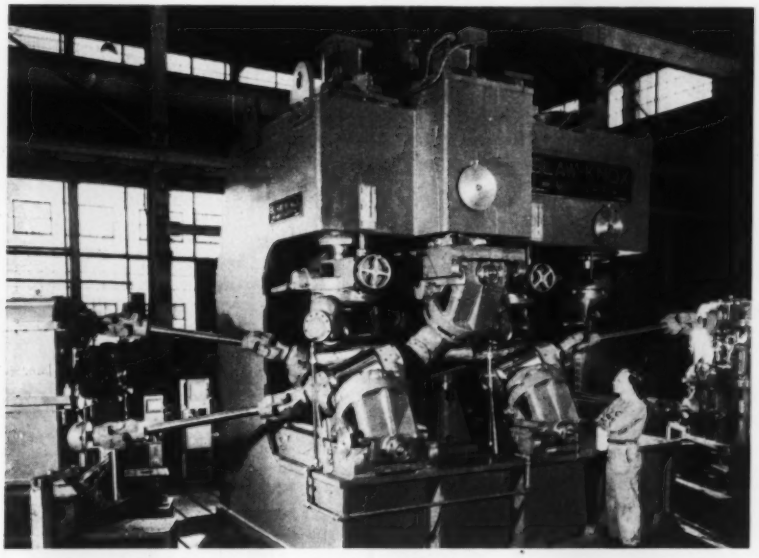
Filter Has Dual Purpose

A COMPACT, self-contained filtration and pump unit offers metalworking shops a solution to problems of ample and properly filtered coolant supply.

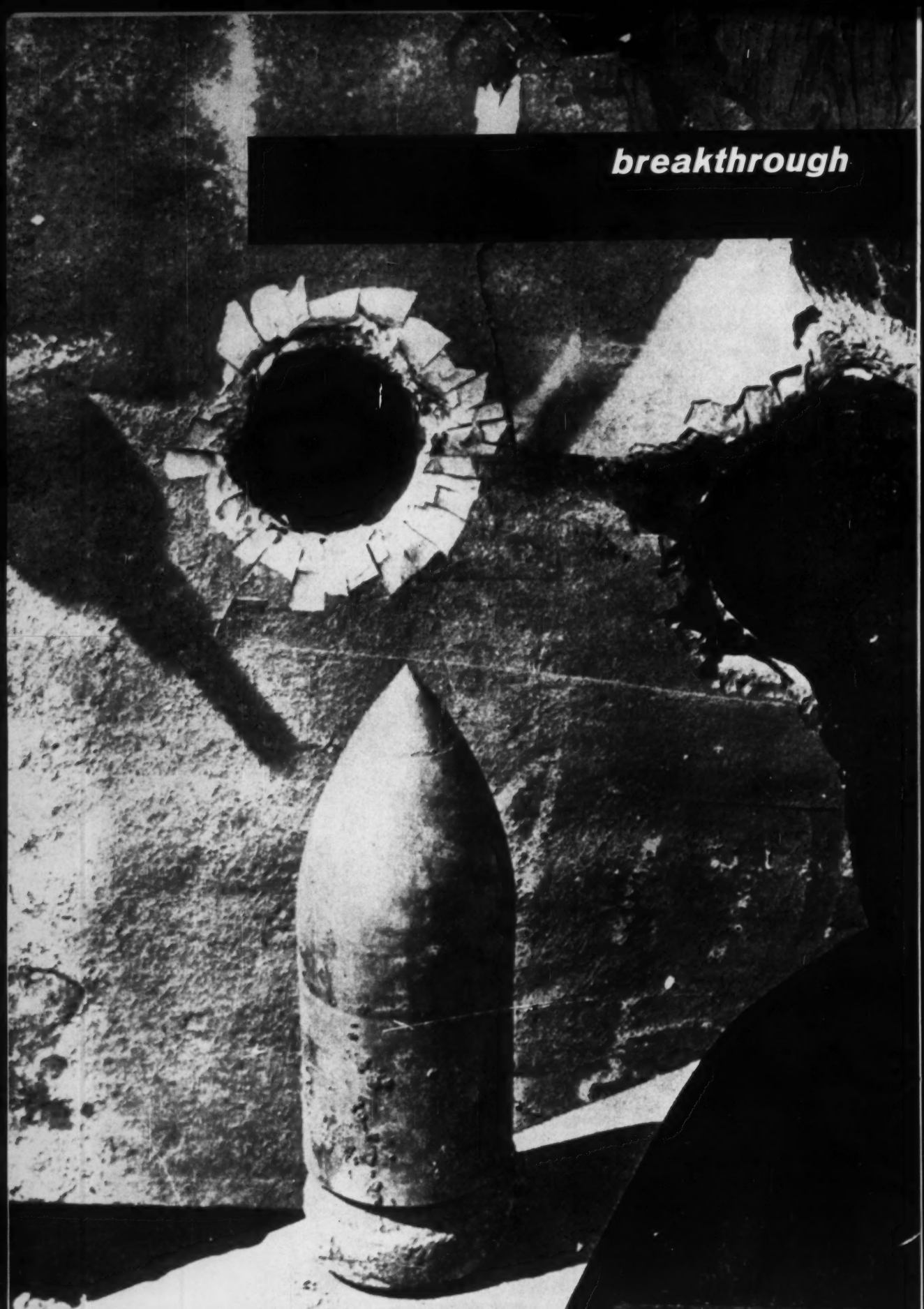
The unit also can provide an efficient means of recovering chips or grindings of precious or semiprecious metals.

The unit is equipped with large (850 sq in., each side) disposable paper filters that can be changed

(*Please turn to Page* 176)



NEW MULTICYCLE TUBE STRAIGHTENING MACHINE will be used by a producer of heat treated oil well casing to straighten large diameter, thin wall, steel tubing. The machine maintains true circular cross section of the work during straightening without guides. It has four driven rolls for balanced turning torque around the tubing. It features a cluster of three rolls (two driven) at the input end, a twin roll bending stand, and another cluster of three rolls (two driven) and a single bending roll at the exit end. For more information, **write** Blaw-Knox Co., 300 Sixth Ave., Pittsburgh 22, Pa.

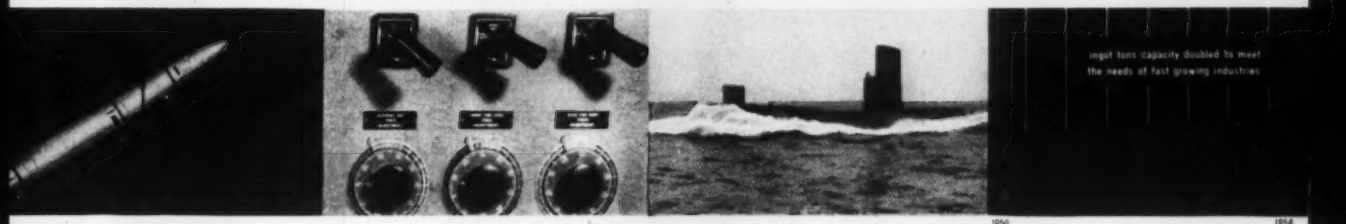

breakthrough

. . . 1898

Sixty years ago, "breakthroughs" like this made headlines around the world. From somewhere in America was coming fantastic new ammunition that shattered Cervera's fleet at Santiago—won victories for Dewey at Manila Bay.

To a unique group of steel specialists, in Reading, Pa., these wondrous new armor-piercing projectiles were especially important. For they represented what was to be only one of a long line of startling discoveries in steel that would eventually unleash the workshops of a nation.

Other "firsts" followed quickly: the earliest automotive alloys; tools steels that pioneered the way to mass production; free-machining stainless steel; and more recently, new processes and wonder alloys bearing strange names most familiar to technicians of the Atomic Age . . . VEGA, MEL-TROL and Free-Cut INVAR "36".



breakthrough . . . today

Quality before *quantity* have been sacred *Carpenter* watchwords down through the years.

Within the past year, however, *Carpenter doubled its ingot tonnage capacity.* New acquisitions, new furnaces, mills and finishers—all completely equipped with precise and unique *Carpenter* quality controls—have started operation.

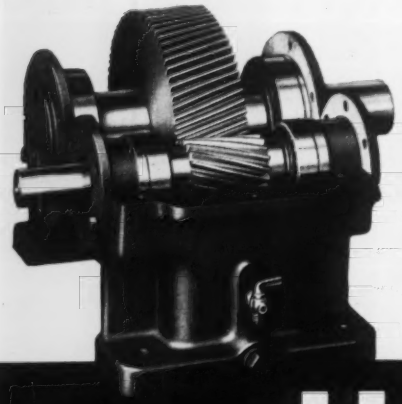
Capacity—mass production of specialty steels for critical applications—is an established fact.

In the years ahead, *Carpenter* will continue to "breakthrough" . . . to lead the way and grow apace of the ever-increasing demands of industry for the world's finest specialty steels.

tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

Carpenter steel

The Carpenter Steel Company
Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.



Eliminate Your Down Time Worries . . .

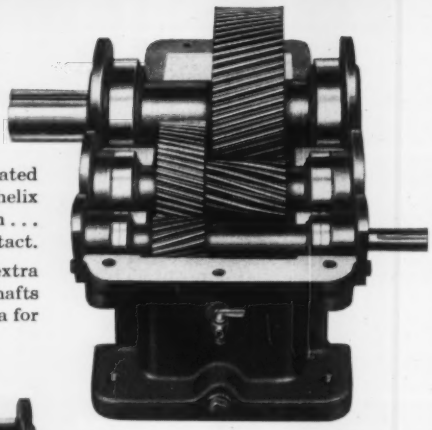
Specify H & S Helical Speed Reducers

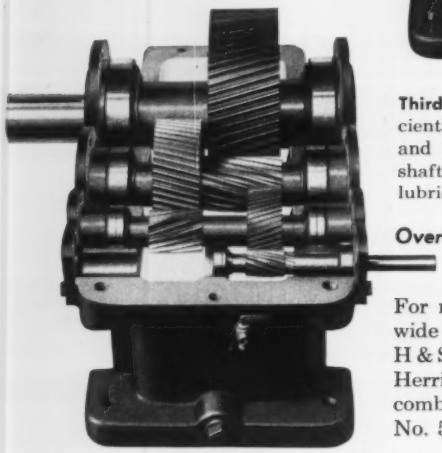
Single · Double · Triple Reduction

Extra rugged construction, simplicity of design are your assurance of consistent day-in-day-out trouble-free operation and exceptionally long service life. Here's why:

First—The helix gears are generated by H & S at the most efficient helix angle to insure smooth operation . . . several teeth are always in contact.

Second—Heavy-duty housings, extra bearing capacity and oversize shafts guarantee ample reserve stamina for the most exacting demands.





Third—Bearings and gears are efficiently splash lubricated, and dust and oil-proof seals on extending shafts keep out trouble—keep in lubricant.

Overall design conforms to AGMA specifications

For more detailed specifications, wide size and capacity range of H & S Speed Reducers (Helical, Herringbone, Worm Gear and combinations) write for Catalog No. 55.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 Hamilton Avenue • Cleveland 14, Ohio

NEW PRODUCTS and equipment

easily. It will maintain filtration efficiency in the order of 5 microns.

For more information, *write* Electroforce Inc., Fairfield, Conn.

Electrolytic Etch Mark Made in 15 Seconds

IDENTIFICATION, trademarks, and inspection code numbers can be etched on parts and assemblies in 15 seconds with the VT-15A power unit operating through specially prepared stencils. A mark 0.003 in. deep can be produced in 15 seconds on ferrous metals.

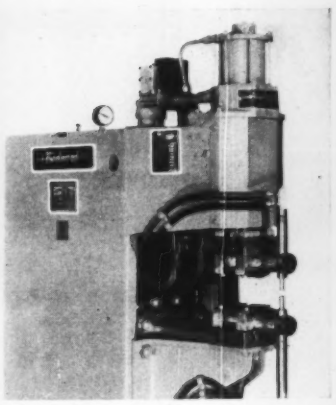
Electrolytic marking is suited for small, delicate parts or thin cross sections because of the absence of destructive stresses and deformation.

For more information, *write* Lectroetch Co., 14925 Elderwood Ave., East Cleveland 12, Ohio.

Press Resistance Welders Available in Three Types

BUILT to deliver high production runs at lowest cost, the new line of Federal press type resistance welders ranges from 30 to 500 kva.

Each size is available as a spot-welder, a projection welder, or a combination spot and projection welder in a range of throat depths, electrode forces, and transformer sizes.



New design features include a one-piece slim line frame that takes less floor space and gives greater working area, and an antifriction

UNITED®

46" x 90" SLABBING MILL

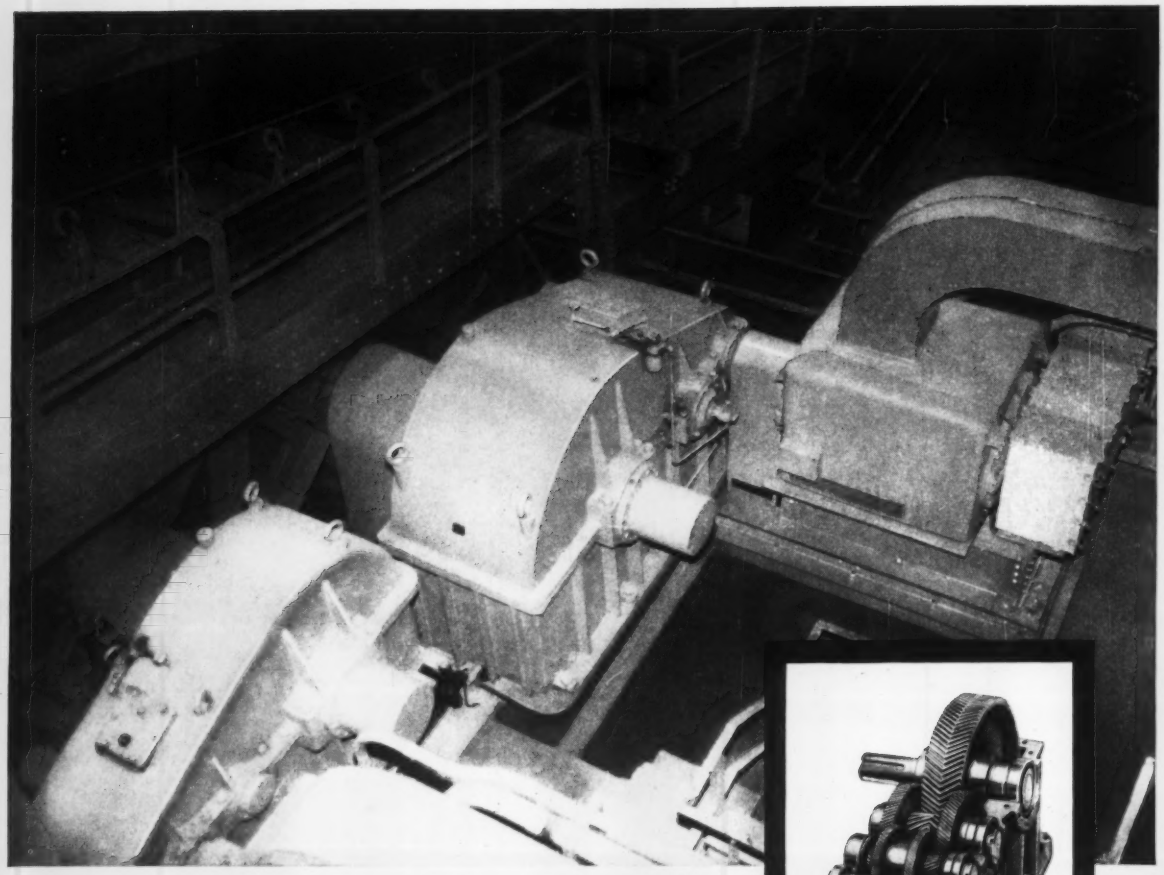
UNITED ENGINEERING AND FOUNDRY COMPANY

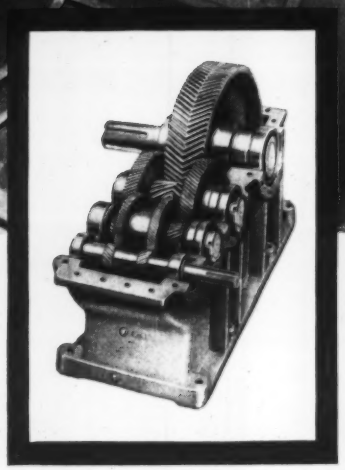
PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.





PHILADELPHIA REDUCERS ARE HEAVY DUTY "PLUS"...

and the big jobs prove it!

The big jobs, like these 1,500,000 inch-lb. output torque units in a taconite processing plant, are the ones that demand the extra "plus" in reliability and performance of Philadelphia Parallel Shaft Reducers.

In reliability, Philadelphia Reducers are the "heavies" of the heavy duty drives, with extra strength built into every part. Housings are reinforced at points of greatest stress. Bearings are extra heavy to take severe and repeated shock loads . . . handle heavy overhung loads. Shaft alignment is accurate, and shafts have that extra "heft" that keeps them running true.

In performance, these reducers have no equal. Gearing is designed to the needs of each application and symmetrically arranged in the housing. Hence, bearings on each shaft carry equal loads, shaft deflections are minimized, bearings and gearing have higher shock load capacity.

In value, a Philadelphia drive assures long rugged life and freedom from dollar-eating maintenance problems. Pound for pound, horsepower for horsepower, dollar for dollar you can't buy a reducer that will outlast a Philadelphia.

Philadelphia Parallel Shaft Reducers are available in single, double and triple reductions for ratios of 1.25:1 to 292:1. Write today for your copy of catalog H-58.

PHILADELPHIA GEAR CORPORATION
Erie Avenue and G Street • Philadelphia 34, Pennsylvania

philadelphia gear drives

Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.
INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

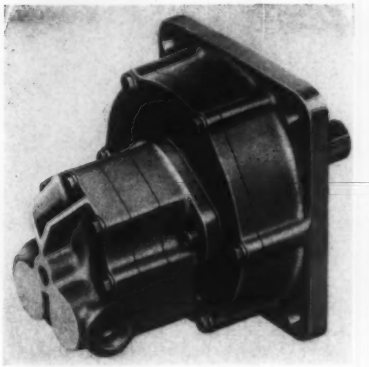
slide that is easily adjusted for wear.

For more information, *write* Federal Machine & Welder Co., Warren, Ohio.

Hydraulic Motor Has Integral Gear Reducer

DESIGNED for the original equipment market, Webster's new hydraulic motor gear reducer consists of a gear type fluid motor mounted as a part of a planetary gear reducer.

It can be used for driving rotary soldering, welding, or heat treating fixtures; powering hoists, cranes, or rope drives; turning turrets and platforms; driving elevators and conveyors.



The high reduction ratio (4.6:1) assures smooth output even at low shaft speeds. The unit is designed to provide 150 ft-lb of output torque when used with an oil source capable of providing 1500 psi.

For more information, *write* Webster Electric Co., Racine, Wis.

Arcwelders Can Be Tailored to Needs

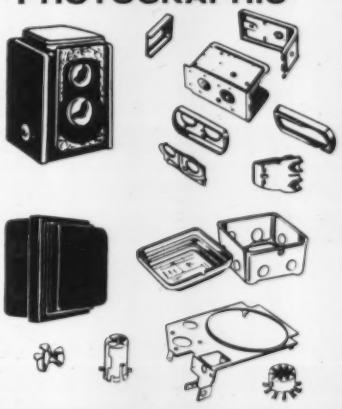
MANY optional features of the TM Idealarc welding machines permit them to be tailored to customer needs. Built for manual arcwelding, they are available as alternating current transformer units, or ac-dc rectifier types.

Optional features which can be selected include remote control of

(*Please turn to Page* 182)

Whatever Your Field Check DE-STA-CO for Stampings with the Plus

ELECTRICAL ELECTRONIC PHOTOGRAPHIC



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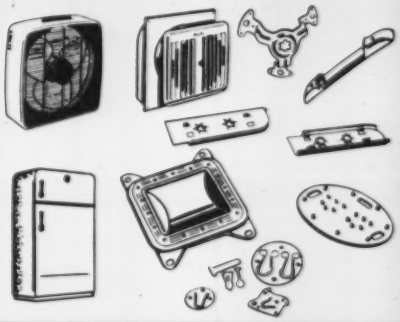
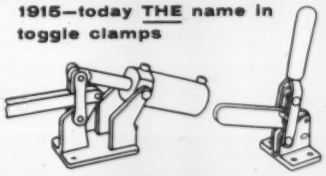


DE-STA-CO—stampings since 1915—today THE name in toggle clamps



De-Sta-Co has been recognized for over 25 years for its leadership in the field of production clamping devices. Today, our engineers are creating improved and special toggle clamps to meet your specialized production problems in every field. Over 130 models, types and sizes, stocking distributors everywhere. Send for catalog.

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Our range of stamping production has made De-Sta-Co known as an important source from coast to coast. We're regular suppliers to the most widely diverse industries—electrical, electronic, photographic—refrigeration, heating and ventilating—hardware, automotive, aircraft. All of these require top quality—and we take off our hats to none—but in addition to quality they want De-Sta-Co's *other* pluses: service, integrity, modern equipment, second operation facilities, ample inventories of all common and many unusual materials. Our know-how is as extensive as you'll find in the business and the big *pluses* we give you *gratis*!

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De-Sta-Co is widely known for toggle clamps, stampings, precision washers, spacers, shims, shim and feeler stock, blower housings and marine specialties.

DETROIT STAMPING COMPANY

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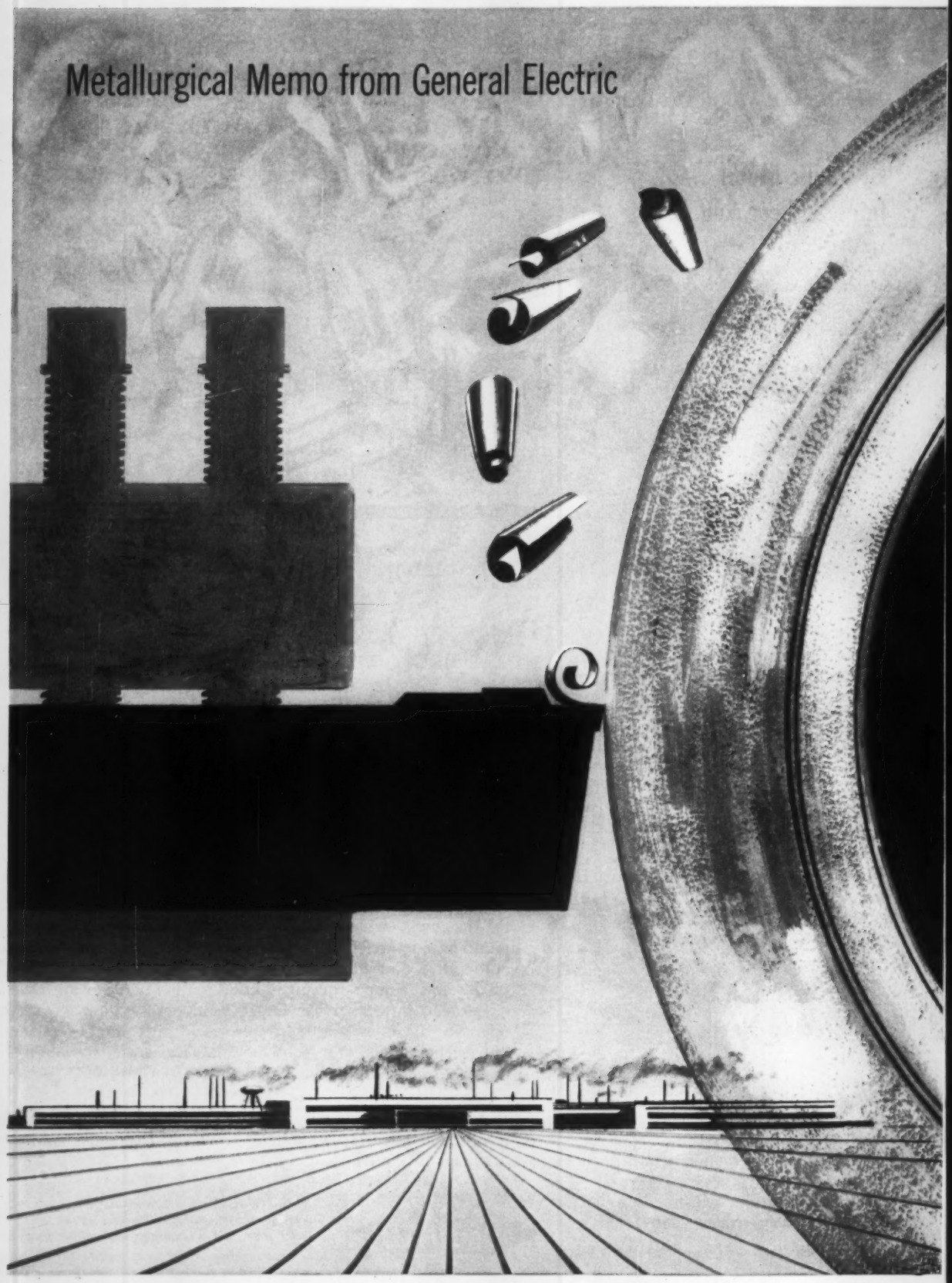
Metallurgical Memo from General Electric

Why 242 different toolholders?

Metallurgical Products Department reports
on an expanded new line of Lift-O-Matic toolholders
. . . 242 sizes to speed changeovers on every job

Nobody needs to tell you what carbides have done for metalcutting . . . or how Carboloy® disposable inserts have led the way. *But making inserts is only half the job;* the other half is to provide you with toolholders that let you get full value from these miracle metals.

Carboloy Lift-O-Matic toolholders do this job. There are now three types—positive rake, negative rake, and tracer. All provide access to the clamp setscrew from either top or bottom—all provide for fastest possible indexing or changeover—all cut your inventory needs by providing interchangeability of parts. In addition, Carboloy *heavy duty* toolholders are made for cutting conditions where a maximum strength holder is demanded.

This expanded Lift-O-Matic toolholder line is stocked by your *local* Authorized Carboloy Distributor—3 types, 9 styles, 242 sizes—*plus* the widest range of styles, sizes, and grades of *inserts* in the industry. Call him (see the Yellow Pages under "Carbides"); or write: *Metallurgical Products Department of General Electric Company, 11141 East 8 Mile Street, Detroit 32, Michigan.*

New! Self-raising chipbreaker clamp. A twist of the wrist releases insert for indexing . . . automatically lifts and lowers chipbreaker. No more prying chipbreaker free. No more fumbling with loose chipbreaker. You choose from three chipbreaker widths for more accurate chip control.

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METALLURGICAL PRODUCTS DEPARTMENT

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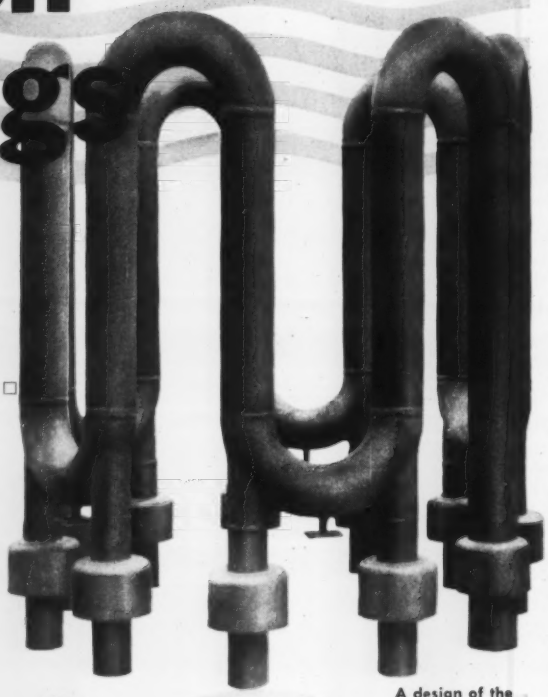
when things are HOT... call on Duraloy



A design of the A. F. Holden Co., Detroit, Mich.

Castings that Keep their Load-Carrying Strength at High Temperatures

This "immersion type radiant heater" is typical of the high reliability castings turned out by DURALOY. Centrifugally cast tubes with *UNIFORM* wall thickness...for longest service life. Static cast collars and shell molded bends...typical of DURALOY versatility.

For your high alloy casting requirements check with DURALOY... our long experience, ultra-modern foundry and up-to-the-minute test equipment will be helpful in solving your problems. For more information ask for Bulletin No. 3150 G.

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current and polarity, a low voltage contactor that reduces open circuit voltage when the machine is on but not welding, a line contactor with overload protection, an arc booster that provides a current surge during arc striking, and power factor correction condensers.

The welders have a current control of the mechanical, movable core reactor type and are made in NEMA rated 300, 400, 500, and 650 ampere sizes.

For more information, *write* Lincoln Electric Co., Cleveland 17, Ohio.

Power Sweeper Cuts Cost Of Narrow-Aisle Cleaning

TRAVELING at speeds up to 5 mph, the Model 53 power sweeper cleans a path 28 in. wide (40 in. with sidebrush) three to seven times faster than is possible with a push broom.

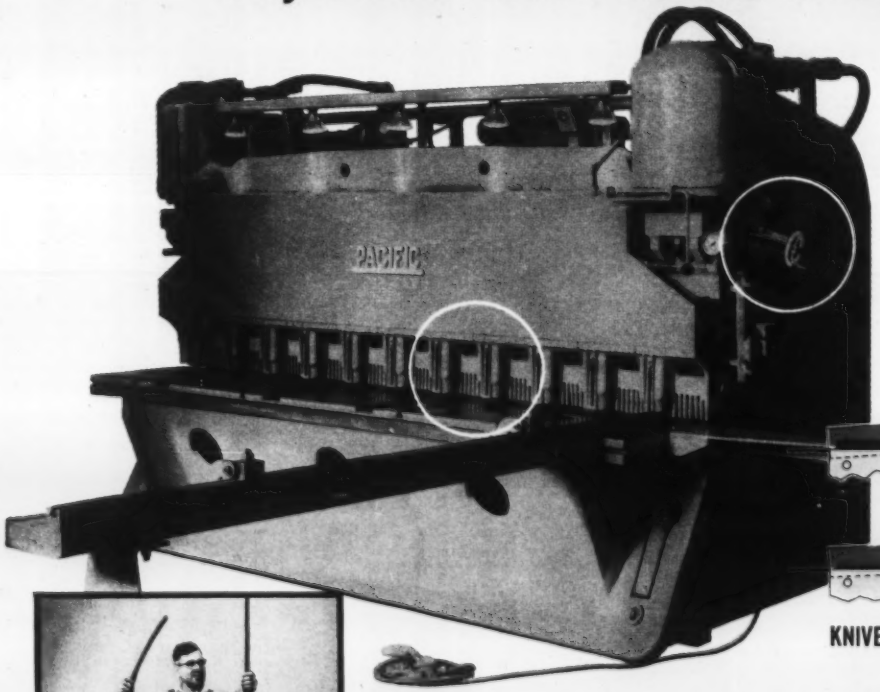
The sweeper picks up heavy bulky

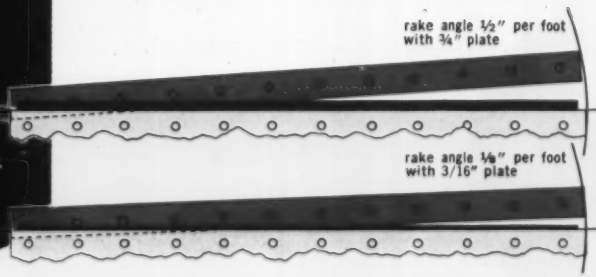
debris and fine dust at the same time. A high speed 28 in. main brush (revolving inside a vacuum-equipped compartment) hurls heavy dirt directly into a 4.5 cu ft hopper. A high volume fan sucks up lighter dust, forcing the dirt-laden air stream through a heavy duty fabric filter.

For more information, *write* G. H. Tennant Co., 721 N. Lilac Dr., Minneapolis 22, Minn.

Adjustable rake PACIFIC HYDRAULIC SHEAR...

the single shear that produces highest quality cuts on both light and heavy metals.





Rake angle adjustable to match plate thickness

KNIVES STAY SHARP UP TO A YEAR OR MORE OF CUTTING 8 HOURS A DAY

Cuts up to 60 strokes per minute with minimum twist, bow and camber.

Left, ¼" plate cut with maximum rake angle. Right, ¼" plate cut with minimum rake angle.

Adjustable rake Pacific does the work of 2 or 3 conventional shears. It saves capital investment, valuable floor area and costs less to install. Heavy duty Pacific pays for itself out of operational savings . . . it takes fewer hands to operate, makes better cuts, requires little or no maintenance, virtually eliminates production downtime.

A Pacific shear for your heaviest cutting eliminates the wasteful expense of slow, costly burning. Powered hydraulically, Pacific cuts with a shockless, cushioned stroke . . . knives stay sharp longer saving cost of regrinding or replacement. Recurring costly downtime for turning or changing knives monthly is practically eliminated. Pacific is "quiet as a sewing machine" . . . it encourages greater efficiency from workers in plant or office.

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35 complex impeller blades are profiled from the solid with this custom-built milling machine. Machining involves compound curvatures, thicknesses and depths. *Cost per piece was reduced from $1,280 to $141.

Machining Cost Reduced 89% with Custom Designed Tools

Critical and growing need for cost reduction in machining complicated parts requires machines tailored to the job.

In this period of increasing complexity of design of many parts and components and during the present evolution of harder, tougher alloys, management and methods men are being compelled to search far and wide for tools more suited to their needs than so-called standard types. In fact, the selection of specially designed tools is indicated more and more since it often goes to the heart of reducing costs all along the line.

As a case in point, the machine illustrated above paid for itself in less than two months. Production time per piece was reduced from 100 hours to 11 hours.

The machine illustrated was designed by the pioneer in the field of tracer control; it is just one of many manufactured by this machine tool builder which employ hydraulic or electronic tracers or which operate from punched cards, punched tape or magnetic tape to meet the exacting demands now present in the metal cutting field. You may have a part or problem involving cost reduction productivity, accuracy or finish. If so, you will find it worthwhile to write the George Gorton Machine Co., 2004 Racine Street, Racine, Wisconsin.

Immediate attention and prompt analysis of your requirements will be provided without obligation.

*Above figures are based on operator cost of $2.80 per hour and machine hourly rate of $10.00.

NEW literature

Write directly to the company for a copy

Merchant Pig Iron

A 28-page book (ADV. 911) gives a brief history of pig iron production. It tells about the various grades Republic Steel produces and the field, laboratory, and mill metallurgical services available. Advertising Div., Republic Steel Corp., 1441 Republic Bldg., Cleveland 1, Ohio.

Valve Finder

A catalog discusses air valves and their selection. It lists all Hannifin valves. Dept. 124, Hannifin Co., Des Plaines, Ill.

Aluminum Building Products

A 12-page booklet describes aluminum industrial building products and accessories. Dept. NR-21, Kaiser Aluminum & Chemical Sales Inc., 919 N. Michigan Ave., Chicago 11, Ill.

Foundry Equipment

"The Story of the Speedmuller," reviews sand preparation needs and helps you determine your exact requirements. Beardsley & Piper, division of Pettibone Mulliken Corp., 2424 N. Cicero Ave., Chicago 39, Ill.

Machine Design Data

"Design Ideas No. 21" gives examples of how the proper use of stiffeners in a machine design can initiate savings in cost. Lincoln Electric Co., Cleveland 17, Ohio.

Expanded Metal Products

Safety Grip strut grating in steel, aluminum, and stainless, and Gold Nugget welding grating are described in a catalog. A companion catalog describes Safe-Gard expanded metal partition panels for conveyor and machine guards, and in-plant partitions. Products Div., Globe Co., 4000 S. Princeton Ave., Chicago 9, Ill.

Rolling Steel Doors

A 16-page catalog, G-59, lists requirements for installation, specifications for manual and automatic power operation, and other data. Rolling Steel Door Div., R. C. Mahon Co., E. Eight-Mile Road, Detroit 34, Mich.

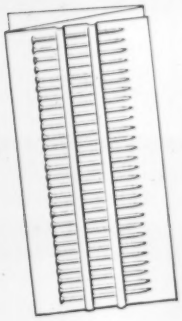
Flexible Hose

Bulletins 83 and 84 show how flexible hose can be used to advantage in air handling and fume control. Flexaust Co., 100 Park Ave., New York 17, N. Y.

Furnaces and Atmosphere Units

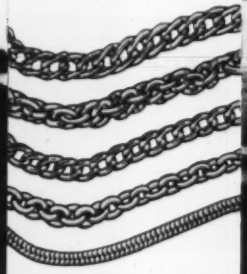
A 12-page bulletin, No. 653A, describes Hevi-Duty's range of electric and fuel fired heat treating furnaces and protective atmosphere generators. Hevi-Duty Electric Co., Milwaukee 1, Wis.

These **PINS** need stiffness



Pin wire needs stiffness, but it must be easily worked to form the heads.

Wire for these **CHAINS** requires a fine Surface and Ductility



Jewelry chains are made from wire that takes a beautiful finish and is easy to work.

We can match your production requirements with Chase® wire!

The Chase Wire Service Man is shown here in a typical conference with production men.

Wherever you use copper alloy wire, it will pay you to see what the Chase® Wire Service Plan can do to help you. Here's how the plan works: You tell us what you do with wire—what properties you need. Tell us the problems you're having, show us the parts you make. A Chase Wire Service Man can help you find the wire that's *right* for your needs among all the types Chase makes. If Chase doesn't already make it, we'll *product-engineer* wire for your needs.

Matching your production requirements for wire comes naturally to the man who knows wire best... the Chase Wire Service Man. You can reach him through your nearest Chase warehouse or District Office—or by writing Chase at Waterbury 20, Connecticut.

PRODUCT-ENGINEERED WIRE

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BRASS & COPPER CO.

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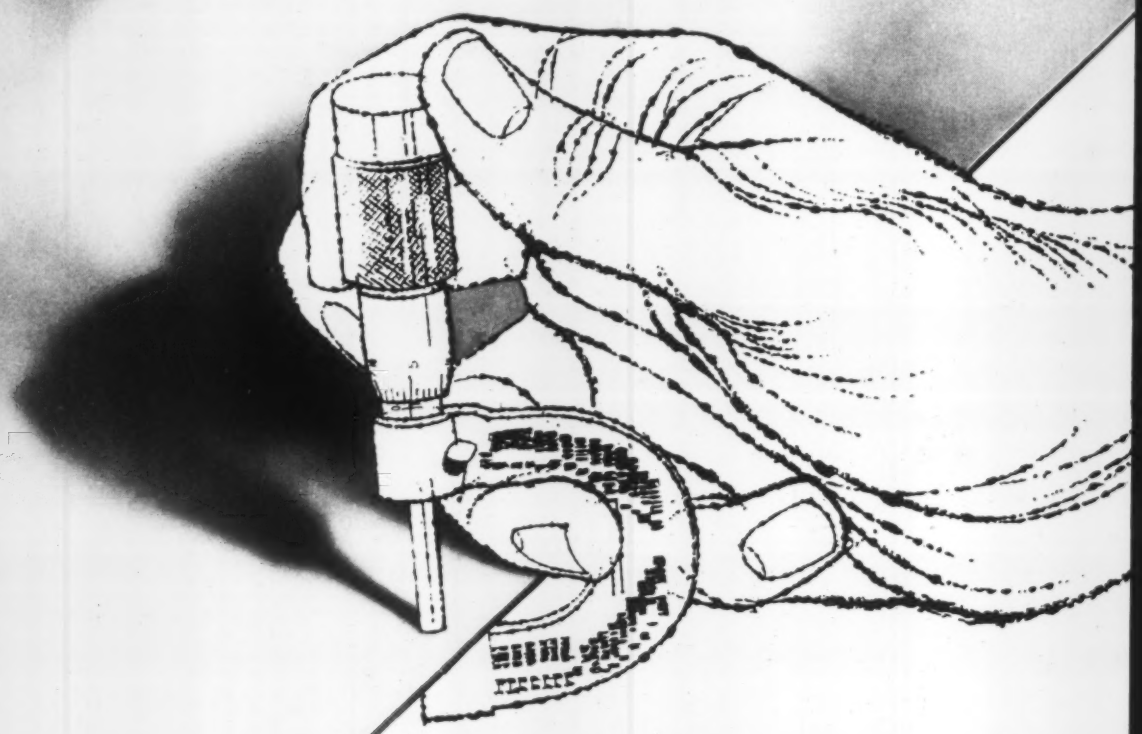

J&L COLD ROLLED SPRING STEELS.. PRECISION INSIDE AND OUTSIDE

INSIDE—Microstructure control through processing techniques developed by J&L offers important advantages. For example, improved stamping, forming and drawing qualities; uniform response to heat treatment; reduction of heat treating distortion. This product is available in various internal structures and is also available in all hardness ranges—dead soft, intermediate and spring tempers.

OUTSIDE—Superior gauge accuracy of J&L precision spring steels made possible by specially developed rolling mill equipment and techniques, saves production dollars. For example, elimination of grinding for gauge accuracy; lower inspection costs; longer tool life; smoother surface finishes.

Investigate the cost-saving possibilities offered by J&L cold rolled spring steels. Contact J&L Stainless and Strip Division, Youngstown 1, Ohio.

STRIP

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TEMPERED SPRING STEEL • ZINC AND COPPER COATED

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April 6, 1959

Stockpiles Growing, But Imbalances Likely

INVENTORY ACCUMULATION is not progressing as smoothly as expected. Some consumers will have enough metal to weather a long steel strike, but some will be caught short.

Last month, steel users added about 1.5 million tons to inventories even though they chewed up steel faster than they had anticipated. This month the situation will be about the same. But next month they will add somewhat less as construction requirements pick up. Also, auto assemblies may pick up if good sales continue. By June 30 they will have upped their stockpiles to 21 million tons (from 13 million on Jan. 1). "That won't be excessive," a market analyst says.

SOME MAY HAVE TROUBLE— If the steelworkers quit work on July 1, most fabricators will be adequately protected for a month or six weeks. If trouble comes sooner, it will be because: 1. Buyers underestimated their first half consumption, didn't order enough steel for May and June delivery, and couldn't get on steelmakers' books for additional tonnage. 2. The best laid plans can result in imbalance from shortage of vital parts.

TRANSPORTATION TIE-UP FEARED— Another possible trouble spot could be shipping facilities. If consumers don't get all the steel they've ordered in the first half, it won't be because the mills haven't done their best to produce it. Finished steel is piling up on shipping platforms because traffic men can't get the freight cars, trucks, and barges they need. Problems: 1. On some railroads, 25 or 30 per cent of the cars need repairs. 2. Many of the independent truckers did so poorly in 1958 that they couldn't maintain their equipment and can't pay for their 1959 licenses. 3. Some consumers became so enamored of truck service when they were living on minimum inventories that they poured blacktop over their railroad sidings. Now they can't get trucks, and they're in no position to accept rail shipments. 4. Winter floods destroyed many barges.

AUTOMAKERS STOCK UP— Fisher Body Div. of General Motors Corp. anticipates no trouble in getting its current inventory (15 days) up to the "desired level" by June 30. Ford Motor Co. will probably have to double up on releases and place additional orders to meet its objective. Its cars have been selling better than expected. One automaker plans a $75 million (14 week) steel inventory by June 30—enough for this year's cars and 45 days' production of 1960 models.

BACKLOGS LEVEL OFF— "We're still taking new orders at a high rate and watching our backlog climb," says one of the largest steelmakers. Others report a conspicuous drop in order entry and clear indications that backlogs have reached their peak. Most mills are sold out for the first half on sheets and heavily committed on hot-rolled bars, plates, line pipe, and oil country goods. Order books are open for the third quarter, but consumers aren't showing much interest.

PRODUCTION SETS RECORD— Last week's production was the largest in history: 2,661,000 net tons of steel for ingots and castings. Steelmakers operated their furnaces at 94 per cent of capacity (up 1 point) and beat the previous week's output by 30,000 tons. During March, they set a monthly record: 11.5 million tons. Best previous effort: October, 1956—11,048,513 tons.

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*Current prices were published in the Mar. 30 issue and will appear in subsequent issues.

METALLURGICAL COMPETENCE: DO YOUR SPECIALTY STEEL SUPPLIERS HAVE IT?

How much confidence do you have in your supplier of specialty steels?

Here's why we ask. We've won over a number of new specialty steel customers in recent months because of our ability and desire to provide top metallurgical assistance. It's paid off for our customers in a number of ways: less rejects, less scrap loss and fewer specification revisions.

Our size of operation is an asset, too. Enables us to produce an end-product—AMBALLOY—uniform in quality, workmanship, and cleanliness. Amballoy enables users to restrict their necessary chemistries to a minimum. Proper heat treating economically matches metal to specs for those ultra-critical applications.

You can count on our metallurgical competence when you desire help with your material selection problems. If your confidence is shaken in your present supplier, contact us: A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

—personalized quality steels from a technically competent source **A. M. BYERS COMPANY**

STEEL
QUARTERLY SURVEY

COMPONENTS	CURRENT INVENTORIES: UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS	2nd Quarter FORECAST: LOWER	SAME	HIGHER
CASTINGS . . . . . Die, gray iron, malleable, nonferrous, steel.	2%	23%	52%	20%	3%	8%	56%	36%
OTHER FORMED COMPONENTS . . . . Forgings, stampings, springs, wire shapes.	1%	13%	46%	26%	14%	12%	57%	31%
MACHINED COMPONENTS . . . . . Bearings, couplings, cylinders, gears, screw machine products.	2%	20%	45%	24%	9%	12%	65%	23%
ELECTRICAL EQUIPMENT, MOTORS . .	6%	25%	45%	16%	8%	10%	73%	17%
FASTENERS	1%	20%	47%	23%	9%	7%	72%	21%
MECHANICAL RUBBER GOODS, BELTING	7%	22%	49%	20%	2%	10%	76%	14%

FIGURES are percentages of respondents to STEEL's quarterly survey. COLOR UNDERSCORED figures show how most respondents reported.

Inventory Buildup Continues

An increase in component stocks is predicted for the second consecutive quarter. The business recovery and slower deliveries are creating some difficulties

THE BUILDUP of component inventories begun last quarter is continuing. However, stockpiling goals have been readjusted in the light of increased business and slower deliveries.

In attempting to increase inventories to carry through the expected steel strike, component buyers have bumped into two problems: 1. The recession recovery has boosted business, diminishing supplies earmarked for summer. 2. The rush for goods has booked producers well in advance, slowing some deliveries.

"We have placed orders for steel requirements through September to be delivered before June 30," says one purchasing agent.

• **No Letup**—For the second consecutive quarter, respondents to STEEL's quarterly survey predicting an increase in stocks outnumber those foreseeing a decline. About 26 per cent say they'll be higher at the end of June than at the conclusion of March. In STEEL's last survey (Jan. 5, p. 441), 27 per cent expected an upturn for the first quarter. Though 10 per cent project lower inventories in June, that's a 4 per cent jump over the last report.

Current reserves are above those of December. Excepting rubber goods, for which there was no change, all categories report 2 to 6 per cent increases in three to six month stock levels. There was a drop in 10 to 30 day supplies and an upturn in 60 to 90 day levels. Reserves under ten days remained stable.

• **Goals Not Reached**—Buyers of castings, machined and other formed components, and fasteners failed to reach inventory goals last quarter. Aims for this quarter have been tempered by the business situation, but stockpiling is still in progress. Electrical and rubber goods purchasers have had better success in raising stock levels. Their goals for the present quarter are not as high as they were at the first of the year. In fact, some reductions may appear.

• **Slower Deliveries**—About 30 per cent of STEEL's respondents mentioned delivery problems. The same number complained last December; at that time, spot shortages were causing moderate inconvenience.

Deliveries are becoming more extended and several companies foresee the situation worsening. Bearings were mentioned by 11 per cent of those polled. Forgings, castings, screw machines, some electrical

equipment, and stampings are also causing troubles.

Paradoxically, 2 per cent of the respondents were overstocked with bearings and 2 per cent had too many forgings. Another 2 per cent said suppliers' deliveries were inadequate.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 199

Demand for reinforcing bars and wire mesh for construction applications is noticeably heavier. Bookings have picked up sharply. They lagged behind other major products earlier this year. This reflects the seasonal upswing in building, and, to some extent, hedge buying against a possible midyear steel strike.

A leading producer of mat reinforcement for buildings and highways has started production of heavier gage material, 6/0 and 7/0 sizes. This welded fabric is being used for the first time in a New York office building.

Easiness in prices continues, notably at the fabricator-distributor level. Imported bars are contributing to the market softness.

New bridge requirements in New England involve 2500 tons of bars. In the Pacific Northwest, bids have been called for June 2 on the proposed Cougar Dam in Lane County, Oregon. This job involves 1225 tons of reinforcing bars, as well as 775 tons of liner plate, 880 tons of structurals, and 60 tons of pipe. Bids are in on 5903 tons of bars required for the Lake Washington floating bridge at Seattle.

Steel Bars . . .

Bar Prices, Page 198

Barmakers' order books are crowded for second quarter, though there's still some tonnage available for May-June shipment. Third quarter ordering is slow in developing, but sellers expect substantial bookings for that delivery position even though a midyear strike should be averted.

Consumers are not building up their stocks as well as they had planned because they have been consuming steel faster than they had anticipated.

While there's been no slackening in demand for hot bars, the situation is somewhat mixed with regard to cold finished. For example, at Pittsburgh, sellers report a sharp drop in their order intake. It appears consumers did most of their inventory buying in February, when they lined up tonnage for April, May, and June delivery. Now they're buying for current requirements.

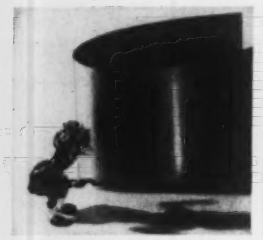
Orders haven't declined in number, but they're down in tonnage. March entries of one area mill were 20 per cent below February's, but shipments were the best in two years.

"We'll ship 10 per cent more this month than we did in March," one company official predicted last week. "May will be about like April. The drop will come in June."

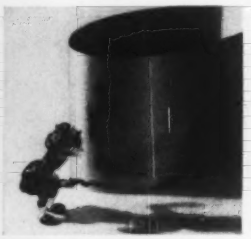
A midwestern producer of cold-finished says its March orders were down about 25 per cent from February's. He attributes the drop to the fact most users' first half requirements have been pretty well covered and they're not yet ready to enter the market for third quarter needs. Most bar users, it's said, think they'll have enough inventory July 1 to withstand a short strike, especially since curtailed con-

No matter which FINISH you like—you can buy it in

MicroRold® QUALITY STAINLESS STEEL

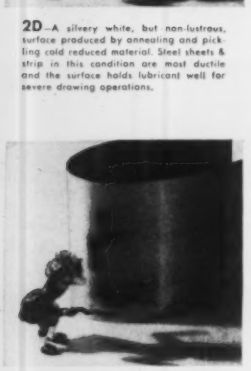


2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.

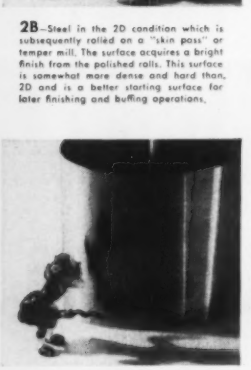


2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.

No. 3—This surface is made by grinding 2B steel with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.



No. 4—A finer finish than No. 3 made by grinding 2B steel with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.



No. 7—Good reflectivity and brilliance made by polishing a No. 4 surface with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.

BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are regularly supplied in all stainless grades (including 18-8 chrome-nickel and 430 straight chromium), with the exception of 430 Bright which is Type 430 exclusively.

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since No. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Department.

WASHINGTON STEEL CORPORATION

41-O Woodland Avenue **Washington, Pennsylvania**

sumption during July and August due to mass vacations will ease any supply pinch.

Carbon and alloy bar volume is heavier in New England. Defense requirements are up. A New Haven, Conn., shop has two contracts for the new U. S. M-14 rifle, totaling $6,194,541. Winchester-Western Div., Olin Mathieson Chemical Corp., got the order.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 199 & 200

All first half production of flat-rolled steel is assigned, either on firm orders, or in tonnage set-asides for customers whose buying habits have long been established. But definite specifications have not been received in many cases for the closing weeks of the second quarter, and they are necessary before set-aside tonnage can be scheduled for rolling.

As leadtime for June in the major tonnage grades expires about Apr. 15, the mills anticipate a marked stepping up in formal ordering against known set-asides.

Building Stocks — Some leading consumers are aiming for a 60-day inventory by the end of June. Others, such as a large manufacturer of capital equipment in the Pittsburgh area, are pointing toward a 90-day inventory. The Pittsburgh firm is not stocking so heavily on silicon sheets because one supplier will not be affected by a strike.

In general, consumers are not going overboard in building stocks, and the mills are encouraging a moderate stocking policy.

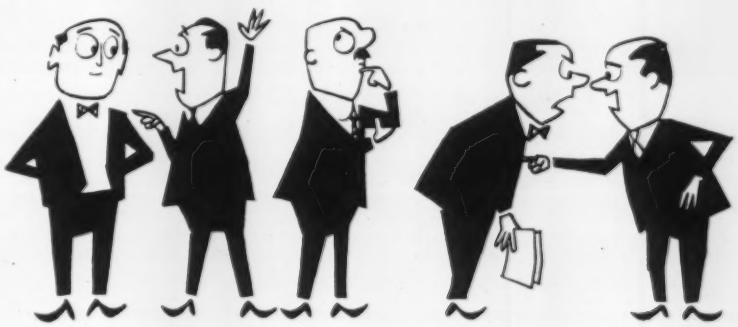
Virtually all producers have opened their books for third quarter business. For the most part, entries are normal for the period; users are just starting to show interest in that delivery position. Actually, they are not rushing to get in tonnage, a situation probably explained by the uncertainties in the market outlook arising from the steel strike threat.

Consumption Gains—Some consumers have been using more tonnage than they had anticipated. So they have not added to their stocks to the extent they had planned. They may be pinched for supplies this summer in event of a prolonged steel strike. However, most buyers think they'll have adequate supplies to bridge a short strike, especially since July-August vacation curtailments will limit consumption during those months. In event a strike is averted, it's figured there'll be plenty of tonnage available, since cancellations are likely even though higher prices are probable, strike or no strike.

Having covered their needs through the first half, New England consumers of sheet and strip are ordering at a slower pace. Most users in the area have ordered eight-to-nine month supplies for shipment before June 30. Based on increased consumption, a considerable number of buyers are supplementing their original hedge orders. The warehouses are also scheduling heavier mill tonnage this quarter.

Slow-down Noted—A spokesman for an eastern sheetmaker last week said: "There has been a definite leveling off in the entry of new orders during the last week. We expect new orders to show a gradual decline through the rest of second quarter."

The Grain Div., U. S. Depart-



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ment of Commerce, closes Apr. 8 on 34,500 aeration duct assemblies for installation in CCC-owned standard metal bins (3250 bushel) in seven midwestern states.

Large contracts for 55 gallon drums, Quartermaster, Columbus, Ohio, include: 175,000 to U. S. Steel Products Corp., New York, $1,224,-500; Myers Drum Co., Oakland, Calif., 57,000 costing $472,530; Inland Steel Container Co., Chicago, 25,000 costing $181,000.

Plates . . .

Plate Prices, Page 198

Supplies of plates are getting tighter. The mills are heavily booked through second quarter, and they are husbanding the little open tonnage still uncommitted for the period. The influx of railroad orders, and requirements of other latecomers have served to plug up most of the holes in mill schedules in a hurry. In event of a strike, some consumers may be pinched for supplies since they haven't been able to build stocks to hoped-for levels.

Although the wider and heavier sheared plates are hard to get, a large manufacturer of capital equipment says its first half inventory is right on schedule. Objective: A 90 day supply by June 30.

"We're having a little trouble with deliveries of a few items," a buyer comments, "but we're keeping the mills current on most of the things we've ordered. If we get through April on schedule, we'll expect smooth sailing until July. We've had a slight increase in our consumption rate, but not enough to affect our planning. If we face a shortage in a certain size, we just shift specs on the steel we've ordered. We hope to have about 80 per cent of our third quarter tonnage booked by Apr. 15."

Even though they're fully committed for the first half on wide plates (up to 160 in.), most producers could probably accommodate a big customer's request for additional tonnage in May or June. Specifications against mill set-asides for June are increasing as the expiration of leadtime for that month approaches.

Mills anticipate high level operations throughout the second quarter. Capital equipment requirements, except for railroads, are still lagging

but, in general, buying is fairly active. Construction needs have spurted recently and tank tonnage is heavier.

Books for third quarter have been opened by most makers, but orders for that position are light, and sellers are making no special effort to stimulate bookings for the period. Lack of large fabricating commitments is limiting forward ordering of plates to some extent.

Tubular Goods . . .

Tubular Goods Prices, Page 202

Seasonal pickup in construction is being reflected in stronger demand for standard pipe. Other classes of tubular goods are also moving better, with buyers anxious to build up stocks against possible strike-induced shortages this summer.

The outlook for oil country goods is promising. Oil well drilling in the U. S. in the latest week of record was reported up, with 2003 rotary rigs drilling, against 1885 a week earlier. Last year at this time, only 1713 rotary rigs were in operation.

Imports Hurt on Coast

Steel imports into the Pacific Coast area have risen 50 per cent in the last year, accounting for about 5 per cent of the area's total steel requirements.

Commenting on the situation, the Federal Reserve Bank of San Francisco says: "Although imports failed to make a substantial inroad on the relatively large market for construction steel, imported tubular and wire products hit some of the area's producers quite heavily.

"Japan accounted for nearly half the area's market for nails and wire products, while West European producers increased their share of the tubular market from 3 per cent in 1957 to almost 25 per cent in 1958."

Structural Shapes . . .

Structural Shape Prices, Page 198

Structural steel bookings in February climbed 25 per cent over the previous month, totaling 294,367 tons, reports the American Institute of Steel Construction. The new orders exceeded last year's February tonnage by 109,000 tons.

Bookings in the first two months

NEW from SEALMASTER®

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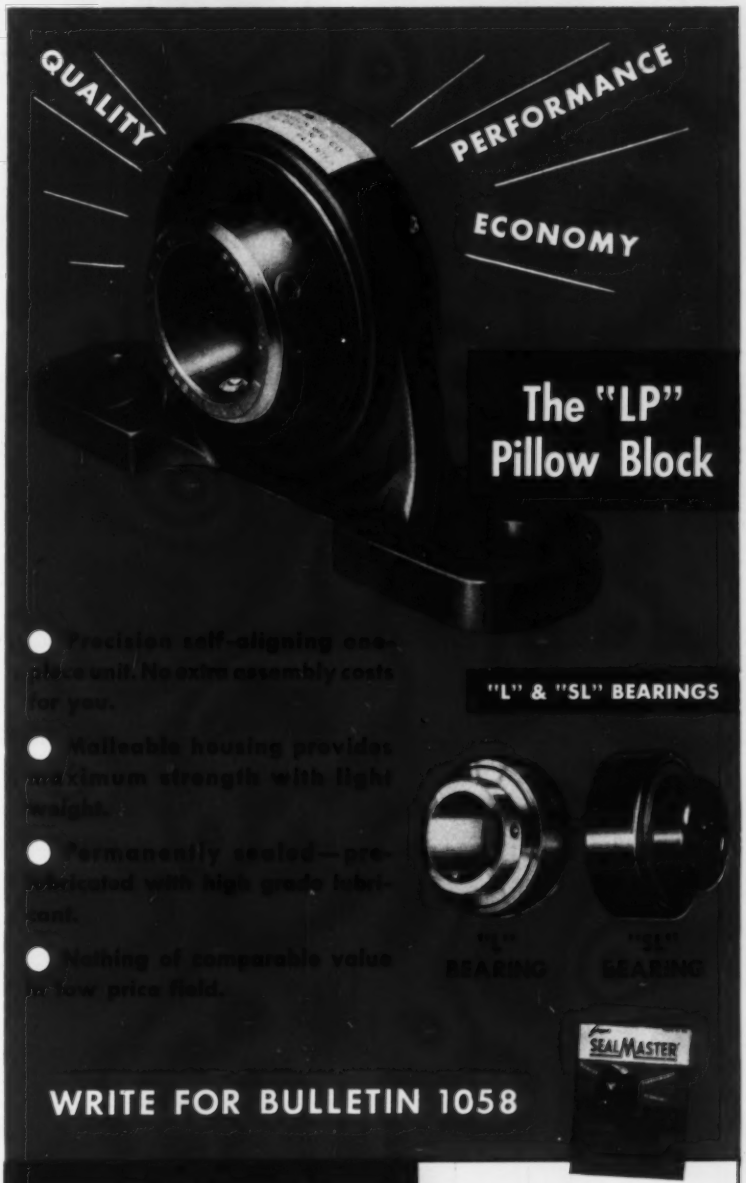

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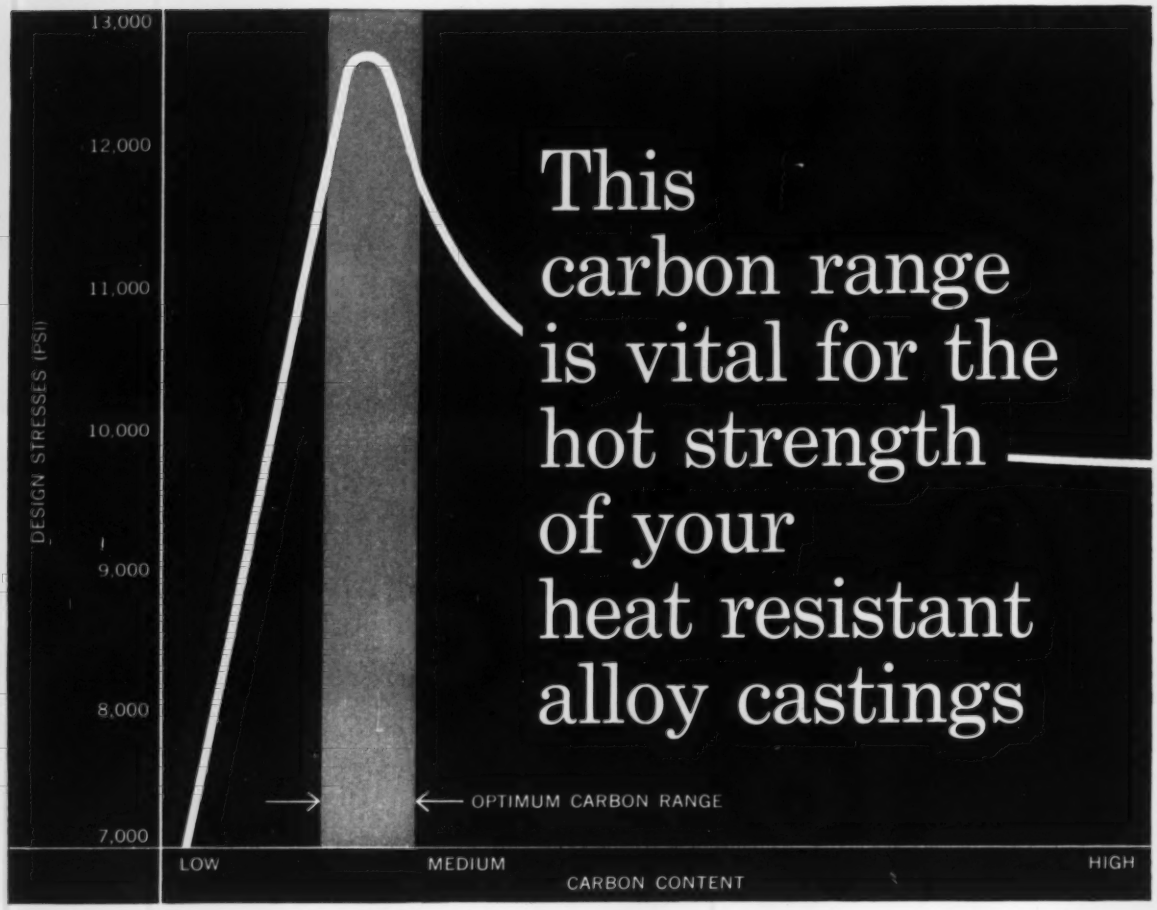

This carbon range is vital for the hot strength of your heat resistant alloy castings

Every foundry heat is analyzed to insure specified alloy composition

This graph illustrates the effect of carbon content on the hot strength of a heat resistant alloy. It outlines an optimum carbon range. The graph shows how a carbon content outside the optimum range would seriously lower the hot strength decreasing the service life of the casting. The optimum carbon range is 0.10 percent.

Controlling carbon content to within one-tenth of one percent is difficult, but Electro-Alloys does it. Compositional control of castings at Electro-Alloys is exact and painstaking. Without this care you cannot expect maximum efficiency and long service life.

We have compiled an imposing file of data on the effects of carbon in alloy composition, and we can relate that data to your needs. To stop rising replacement and maintenance costs, check with us on carbon content while equipment is in the design stage. Contact Electro-Alloys Division, 1024 Taylor Street, Elyria, Ohio, and we will take all steps to insure the optimum composition for your casting.

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION • Elyria, Ohio

this year amounted to 530,151 tons, 52 per cent over the 347,804 tons booked in the like period last year.

Shipments in February were 216,127 tons, off 4 per cent from the January total. Shipments for the first two months of the year were 440,387 tons.

Order backlogs at the end of February totaled 1,853,791 tons. Of this amount, 1,149,904 tons were scheduled for fabrication during the four months ending June 30.

Fabricated structural prices are beginning to firm. Competition is still sharp, but price slashing isn't as rampant as it was a month ago. Largely, the steel strike threat is no longer a dominating factor in the awarding of new construction work. In most cases, where schedules haven't already been set up to avoid possible strike-induced shortages this summer, it's now too late to do anything.

Mill schedules are tightening and deliveries are becoming a little more extended. Bridge estimating is active but industrial and commercial building is slow. More public work is coming out, including schools and highways. Fabricated bridge prices are off in New England 35 to 40 per cent from the peak in 1957.

Public works before the market include an automatic post office and mail processing plant at Providence, R. I. Foreign steel underbid domestic by $600,000 on a radio installation in Maine for the First Naval District, Boston, requiring 4000 tons for towers.

Bookings of west coast fabricators are expected to rise 10 per cent this year over last year's volume. It's thought 1960 volume will be still better, due to an anticipated rise in industrial construction.

A number of tonnages are before the market in the Pacific Northwest. These include 880 tons for the Cougar Dam in Oregon, and 700 tons for the Lake Washington floating bridge, Seattle.

PIPE . . .

CAST IRON PIPE PLACED

335 tons, miscellaneous sizes, Tacoma, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

225 tons, Puget Sound Navy Yard drydock, to U. S. Pipe & Foundry Co., Seattle.

219 tons, 6 to 16 in., for Tacoma (Wash.) water system to the Pacific States Cast Iron Pipe Co., Seattle.

131 tons, various gages, for Wenatchee, Wash., to U. S. Pipe & Foundry Co., Seattle.

100 tons, projects at Silver Lake and Puyallup, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2550 tons, building, Rome Craft Paper Co., Rome, Ga., through Rust Engineering Co., to Ingalls Iron Works, Birmingham.

2325 tons, 98 transmission towers, Public Service Electric & Gas Co., New Brunswick, N. J., to American Bridge Div., U. S. Steel Corp., Pittsburgh.

1710 tons, 1025 ft combination stringer and girder bridge, Messalonskee Stream, interstate Route 95, Waterville, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Cianchette Bros. Inc., Pittsfield, Maine, general contractor; 1500 tons, steel H-beam piles, to Bethlehem Steel Co., Bethlehem, Pa.

1500 tons, Cooper Union Engineering Building, Astor Place, New York, through Vermilya Brown Co. Inc., to American Bridge Div., U. S. Steel Corp., Pittsburgh.

1400 tons, building, First National Bank, Atlanta, to Ingalls Iron Works, Birmingham.

1200 tons, medical and surgical building, State Hospital, Bronx, N. Y., through Depot Construction Co., to Lehigh Structural Steel Co., Allentown, Pa.

1028 tons, state bridges, Queens, N. Y., through Slattery Contracting Co., general contractor, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

985 tons, 37 towers, Public Service Electric & Gas Co., Woodbury, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

900 tons, electrical switchyard, New York Power Authority, Lewiston, N. Y., to Societa Anonima Electrificasione, Milan, Italy.

850 tons, factory, Nestle Chocolate Co., Salinas, Calif., to Bethlehem Pacific Coast Steel Corp., San Francisco.

835 tons, garage, Prudential Insurance Co., Newark, N. J., to Oltmer Iron Co., Jersey City, N. J.

700 tons, animal husbandry building, Cornell University, Ithaca, N. Y., through Walter A. Stanley Inc., general contractor, to Standard Structural Steel Co., Hartford, Conn.

600 tons, state highway structures, Mohawk

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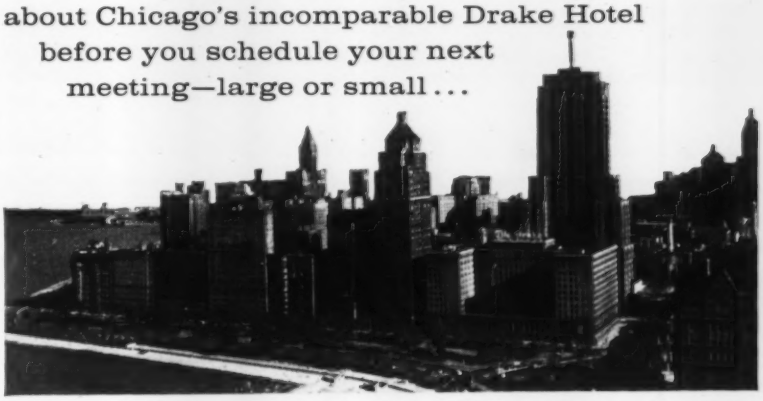

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section, New York Thruway, Schenectady-Albany counties, New York, to Schenectady Steel Co., Schenectady, N. Y.; L. G. DeFalice & Son Inc., North Haven, Conn., general contractor.

545 tons, state highwaywork, Ansonia, Conn., through Mariani Construction Co., general contractor, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

500 tons or more, including reinforcing bars, Bear Creek Bridge No. 2, and overpass, Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.; McLean Contracting Co., Baltimore, general contractor.

355 tons, warehouse, American Can Co., Atlanta, Ga., to Mississippi Valley Steel Co., St. Louis.

355 tons, chemical plant, Union Carbide Chemical Co., a division of Union Carbide Corp., Seadrift, Tex., to Campbell Steel Co., San Antonio, Tex.

275 tons, Sears, Roebuck Shopping Center, Renton, Wash., to Isaacson Iron Works, Seattle; Cawdrey & Vemo, Seattle, general contractor.

275 tons, plant extension, Mundet Cork Corp., North Bergen, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, four traveling gantry cranes for municipal pier, Anchorage, Alaska, to Washington Iron Works, Seattle.

195 tons, manufacturing plant, Staten Island, N. Y., through Turner Construction Co., general contractor, to B. Katchen Iron Works, Newark, N. J.

175 tons, warehouse extension, Johns Manville Co., Lompoc, Calif., to Judson Pacific Steel Co.

160 tons, Hanson Dam, near Seattle, to unstated fabricators; Kaiser Construction Co., general contractor.

STRUCTURAL STEEL PENDING

1795 tons, steel H-beam piles, piers, Washington channel bridge; bids in to District of Columbia, Department of Highways & Traffic.

1400 tons, engineering building, Cooper Union, New York; bids closed.

1225 tons, Cougar Dam, South Fork McKenzie River, Lane County, Oregon; bids June 2, U. S. Engineer, Portland, Oreg.; also, 200 tons tainter gates; 285 tons sliding gates; 60 tons of pipe and fittings.

1200 tons, laundry for city hospitals, Brooklyn, N. Y.; bids closed April 1.

1100 tons, three state bridges, Worcester, Mass.; bids Apr. 14, Massachusetts Department of Public Works, Boston.

880 tons, also 60 tons of pipe and fittings, Cougar Dam, Lane County, Oregon; bids to U. S. Engineer, Portland, Oreg., June 2.

700 tons, second Lake Washington floating bridge; Guy F. Atkinson Co., South San Francisco, Calif., is low at $10,969,587.

500 tons, three steel bridges and approaches, interstate Route 93, Methuen, Mass.; also, seven prestressed and concrete structures; bids Apr. 7, Massachusetts Department of Public Works, Boston.

206 tons, also 35 tons of reinforcing, Washington State truss bridge, Lewis County; Parker Construction Co., Chehalis, Wash., general contractor at $150,932.

100 tons or more, warehouse and overhead crane; bids to the Bureau of Water Works, Portland, Oreg., March 31.

100 tons or more, hot cell and maintenance shops, four structures, and facilities, reactor experiment station, Arco, Idaho; Teller Construction Co., Idaho Falls, Idaho, low at $666,500 to Atomic Energy Commission.

100 tons, 60-ton bridge crane, Hills Creek powerhouse, Oregon; Berger Engineering Co., Seattle, low at $51,301, to U. S. Engineer, Portland, Oreg.

REINFORCING BARS . . .

REINFORCING BARS PLACED

370 tons, state highway structures, Mohawk section, New York Thruway, Schenectady-Albany counties, New York, to Albany Steel & Iron Supply Co., Albany; L. G. DeFalice & Son Inc., North Haven, Conn., general contractor.

300 tons, Sears, Roebuck Shopping Center, Renton, Wash., to Northwest Steel Rolling Mills Inc., Seattle; Cawdrey & Vemo, Seattle, general contractor.

130 tons, maintenance building, University of Massachusetts, Amherst, Mass., to Scherer Steel Co., East Hartford, Conn.; Columbia Construction Co., Malden, Mass., general contractor.

REINFORCING BARS PENDING

5903 tons, second Lake Washington floating bridge, Seattle; bids in to Olympia, Wash.

5903 tons, Washington State, second Lake Washington floating bridge; Guy F. Atkinson & Co., South San Francisco, Calif., low at $10,969,597, subject to 90 day delay to complete financing.

33,000 tons, Wanapum Dam, Columbia River; bid date set for May 8 to Grant County P.U.D. No. 2, Ephrata, Wash.

33,000 tons, Wanapum Dam, Columbia River; bids to Grant County P.U.D. No. 1, Ephrata, Wash., probably in May; plans by Harza Engineering Co., Chicago.

2825 tons, south approach, Washington State, Lake Washington freeway bridge, Seattle; S. S. Mullen Inc., Seattle, low at $2,479,212.

2000 tons, garage structure, Seattle, general contract to Utah Construction Co.

1225 tons, Cougar Dam, Lane County, Oregon; bids to U. S. Engineer, Portland, Oreg., June 2.

510 tons, Washington State freeway underpasses, Seattle; bids to Olympia, Wash., Apr. 14.

375 tons, Washington State, four traffic separation bridges, King County, S. S. Mullen Inc., Seattle, low at $366,150.

250 tons or more, composite building, Clear Air Base, Alaska; Baker & Ford, Bellingham, Wash., low at $3,666,499 to the U. S. Engineer.

200 tons, Washington State highway project, King County; also 70 tons, Clark County; bids to Olympia, Wash., Mar. 31.

130 tons, Washington State, King County overpass; bids to Olympia, Wash., Apr. 14.

100 tons or more, Oregon State, four highway bridges on steel piling, Lane County; Earl L. McNett, Eugene, low at $477,817.

100 tons or more, Oregon State, five grade separations, Malheur County; Pacific Concrete Co. and Otis P. Jordan Jr., Portland, Oreg., joint low at $533,333.

PLATES . . .

PLATES PLACED

1395 tons, alloy, three contracts, General Stores Supply Office, Navy, Philadelphia, to Lukens Steel Co., Coatesville, Pa.

1220 tons, alloy, three contracts, General Stores Supply Office, Navy, Philadelphia, to U. S. Steel Corp., Pittsburgh.

695 tons, high tensile, grade Hy-80, two lots, Navy Purchasing Office, Washington, D. C., to Lukens Steel Co., Coatesville, Pa.

400 tons, vapor saving tanks, Socony Mobil Oil Co., East Boston, Mass., to Chicago Bridge & Iron Co., Chicago.

107 tons, alloy, General Stores Supply Office, Navy, Philadelphia, to Lukens Steel Co., Coatesville, Pa.; also, 40 tons of stainless plates to Ingersoll Steel Div., Borg-Warner Corp., Chicago.

PLATES PENDING

10,000 tons, 60 in. pipe, Industrial Water Board, Birmingham; bids May 5, with alternates on 54 in. steel pipe transmission main.

2000 tons or more (if plate), 28,200 ft 48-in. water line; T. L. Hanning & Associates, Portland, Oreg., low at $800,030 to Everett, Wash., for concrete cylinder pipe; Sultan River project.

200 tons or more, 400,000 gallon elevated water tank; also H-piling and reinforcing steel involved, Glasgow (Mont.) Air Base; Pittsbugh-Des Moines Steel Co., Seattle, is low bidder at $107,899 to the U. S. Engineer, Walla Walla, Wash.

100 tons or more, standpipe, Waterford, N. Y.; bids Apr. 17, water commissioners, contract E.

Unstated tonnage, 150,000 gallon elevated tank, launcher area, Langley AFB, Virginia; bids Apr. 21, U. S. Engineer, Norfolk, Va.

RAILS, CARS . . .

RAILROAD CARS PLACED

Norfolk & Western, 1000 seventy-ton hopper-cars, to its own shops at Roanoke, Va.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

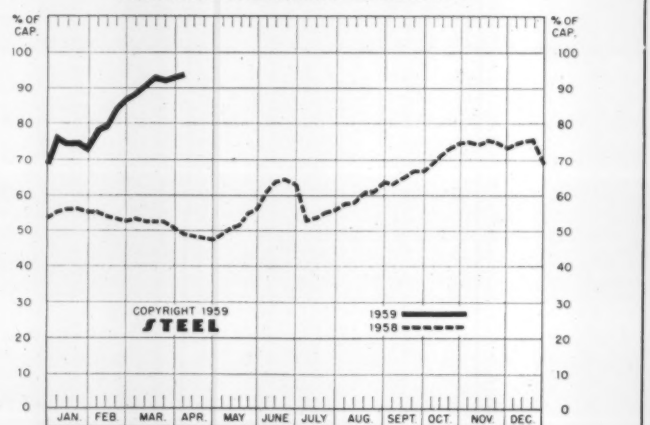
	Week Ended Apr. 5	Change	Same Week 1958	Same Week 1957
Pittsburgh	96	+ 1*	52.5	95
Chicago	96.5	+ 1*	53	87
Eastern	92	+ 1	49	95
Youngstown	93	+ 1	45	89
Wheeling	95	+ 2	67.5	90
Cleveland	96.5	0*	34.5	93.5
Buffalo	105	0	37	98
Birmingham	89.5	+ 1	53	97
Cincinnati	90.5	— 4*	46	69.5
St. Louis	90.5	+ 2.5*	70	101
Detroit	97	— 2*	22.5	95.5
Western	98	+ 3	63	104
National Rate	94	+ 1	48.5	92.5

INGOT PRODUCTION‡

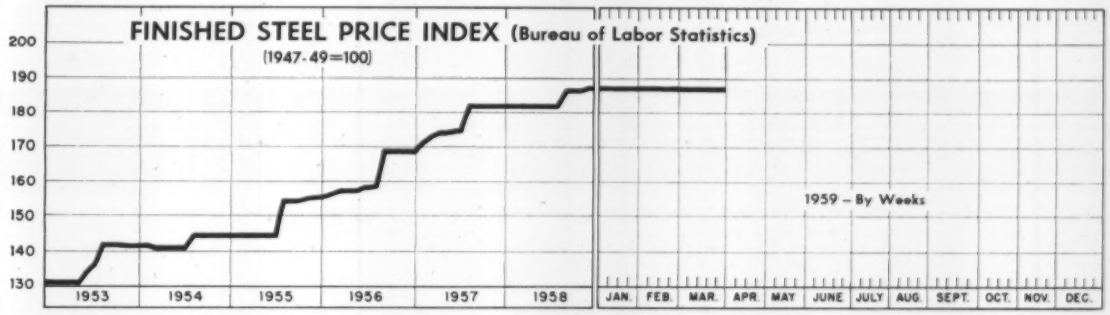
	Week Ended Apr. 5	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	165.2†	163.8	159.1	81.7
NET TONS (In thousands)	2,653†	2,631	2,556	1,312

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Mar. 31, 1959	Week Ago	Month Ago	March Avg	Year Ago
186.7	186.7	186.8	186.7	181.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended March 31

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.673
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.53
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	207.515
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	April 1 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.73
No. 2 Fdry. Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	37.00	39.33	42.33	34.33	24.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	April 1 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ½-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	April 1 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$36.50	$38.50	$44.50	$33.50	$25.50
No. 1 Heavy Melt, E. Pa.	36.00	38.00	40.00	38.50	22.00
No. 1 Heavy Melt, Chicago	38.50	41.50	42.50	31.00	26.00
No. 1 Heavy Melt, Valley	40.50	43.50	46.50	34.50	23.50
No. 1 Heavy Melt, Cleve.	36.50	39.50	42.50	31.50	20.50
No. 1 Heavy Melt, Buffalo	39.50	39.50	39.50	28.50	24.00
Rails, Rerolling, Chicago	60.50	62.50	62.50	54.50	34.50
No. 1 Cast, Chicago	47.50	48.50	48.50	41.50	36.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, April 1, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 199; footnotes, page 201.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Ecomony,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3. 104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 ....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2. .99.50
LosAngeles E3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro, Ky. G8 ....99.50
Seattle B3 .....113.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14 .99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3....109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32. 119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3. 126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ...140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2. 119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 .....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14 .119.00
S.Duquesne,Pa. U5 ....119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ...122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1. 6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11. 6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14. 6.40
SparrowsPoint,Md. B2 .6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1.5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ...5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 .....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ...5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif K1 .....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1.8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ...8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ...5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ...6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 .....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1.5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ...5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 .....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 .....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 .....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 .....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1.7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 .....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ...6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O.(23) R2 .....6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1.5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 .....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 .....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 .....5.675
Portland,Oreg. O4 .....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle B3, N14 .....6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15..5.673
Sterling,Ill.(9) N15 ....5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11 ..6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ...6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ...8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Leaded (Including leaded extra)

Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12 ..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2.7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2 .9.10
Mansfield,Mass. B2 .....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5 ...8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 .6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ...9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 .....9.325
Harvey, Ill. B5 .....9.025
Lackawanna,N.Y. B2 ...9.025
LosAngeles P2, S30 ....11.00
Mansfield,Mass. B5 ...9.325
Massillon,O. R2, R8 ....9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ...9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ....9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ...5.675

BARS, Reinforcing, Billet (Fabricated; To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 .....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ...14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt) L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ...5.575
Franklin,Pa.(4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Lackawanna,N.Y. B2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary, Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ....7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ....6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ...6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 .....6.975‡
MartinsFerry,O. W10 .6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ...8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div. U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steel's
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa.(25) B2 ..5.10
Lackawanna,N.Y.(25) B2.5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle (25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 ....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1.7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3.8.325
SparrowsPoint,Md. B2 .7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ..7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 ....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 ....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20 ..7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 ....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 ....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ....7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ..7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5..7.425
NewHaven,Conn. D2...7.875
NewKensington,Pa. A6.7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ..7.975
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 ....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ....15.85
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ..10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
New York W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
New York W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ...7.525*
McKeesport,Pa. E10 ..7.50*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ..7.975
Youngstown S41 ....7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 ....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9 10	$9 35	$9 75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)			
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 ....$8.20
Fairfield,Ala. T2 .....8.30
Fairless,Pa. U5 .....8.30
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.20
GraniteCity,Ill. G4 ....8.30
Ind.Harbor,Ind. I-2, Y1.8.20
Irvin,Pa. U5 .....8.20
Niles,O. R2 .....8.20
Pittsburg,Calif. C11 ....8.85
SparrowsPoint,Md. B2 ..8.20
Weirton,W.Va. W6 .....8.20
Yorkville,O. W10 .....8.20

HOLLOWARE ENAMELING

Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 ....7.95
Ind.Harbor,Ind. Y1 ....7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES

(Special Coated, Base Box)

Gary,Ind. U5 .....$10.05
Irvin,Pa. U5 .....10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

Fully Processed (Semiprocessed ½c lower)	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths)	T-72	T-65	T-58	T-52
Fully Processed (Semiprocessed ½c lower)				
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-77
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 .....8.00
Crawfordsville,Ind. M8..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 ....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ..8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 ....8.25
Kokomo,Ind. C16 .....8.10
LosAngles B3 .....8.95
Minequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16..8.00
N.Tonowanda,N.Y. B11..8.00
Palmer,Mass. W12 ....8.30
Pittsburg,Calif. C11 ....8.95
Portsmouth,O. P12 ....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ...8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 ....13.40
KansasCity,Mo. U3 ...12.90
Minnequa,Colo. C10 ...12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ..12.95
Palmer,Mass. W12 ....13.70
Pittsburg,Calif. C11 ..13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ..13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Minequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ..10.05
Palmer,Mass. W2 ....10.05
Pittsburg,Calif. C11 ....10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 ....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ...9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 ..10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 ....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Milbury,Mass.(12) N6 .10.05
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 ....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 ....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 ....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Dealers (33)

Wheeling,W.Va. W10	$9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
Los Angeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
Sterling(37)N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	

WIRE, Merchant Quality (6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70†§
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13 50. †5c. ‡10c. ††Less than 10c. †††10.50c. ‡‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter ..	55.0
3¼ in. thru 6 in. ..	50.0
Longer than 6 in. ..	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in. ..	40.0
Longer than 6 in. ..	31.0
¾ in. thru 1 in.:	
6 in. and shorter ..	37.0
Longer than 6 in. ..	31.0
1¼ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter ...	55.0
3¼ in. thru 6 in. ..	50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter ..	48.0
Larger diameters and longer lengths ...	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter ..	48.0
Larger diameters and longer lengths ...	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam.	50.0
¾ in. diam	47.0
⅞ and 1 in. diam..	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller..	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger..	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller..	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller..	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger..	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller..	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger..	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller..	35.0
¾, ⅞, and 1 in. ..	16.0
Longer than 6 in.:	
⅝ in. and smaller..	3.0
¾, ⅞, and 1 in. ..	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller..	20.0
¾, ⅞, and 1 in..	+ 5.0

Longer than 6 in.:

⅝ in. and smaller..	+19.0
¾, ⅞, and 1 in. ..	+39.0

Flat Head Cap Screws:

¼ in. and smaller, 6 in. and shorter ..	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter ..	+ 5.0
Longer than 6 in. ..	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85 ⅞ in. and smaller by 6 in. and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2¼	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.395c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling—Ingot	Rerolling—Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	H.R. Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	28.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	31.50	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	29.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	32.75	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	34.00	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	34.50	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	38.25	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	39.75	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	51.25	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	63.75	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	51.25	64.50	68.50	71.75	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	62.25	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	41.50	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	22.25	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	34.75	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	22.50	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates—Carbon Base 5%	Plates—Carbon Base 10%	Plates—Carbon Base 15%	Plates—Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.06	....

	Strip, Carbon Base—Cold Rolled—10%	Strip, Carbon Base—Cold Rolled—Both Sides
*Copper**	*$36.20*	*$43.15*

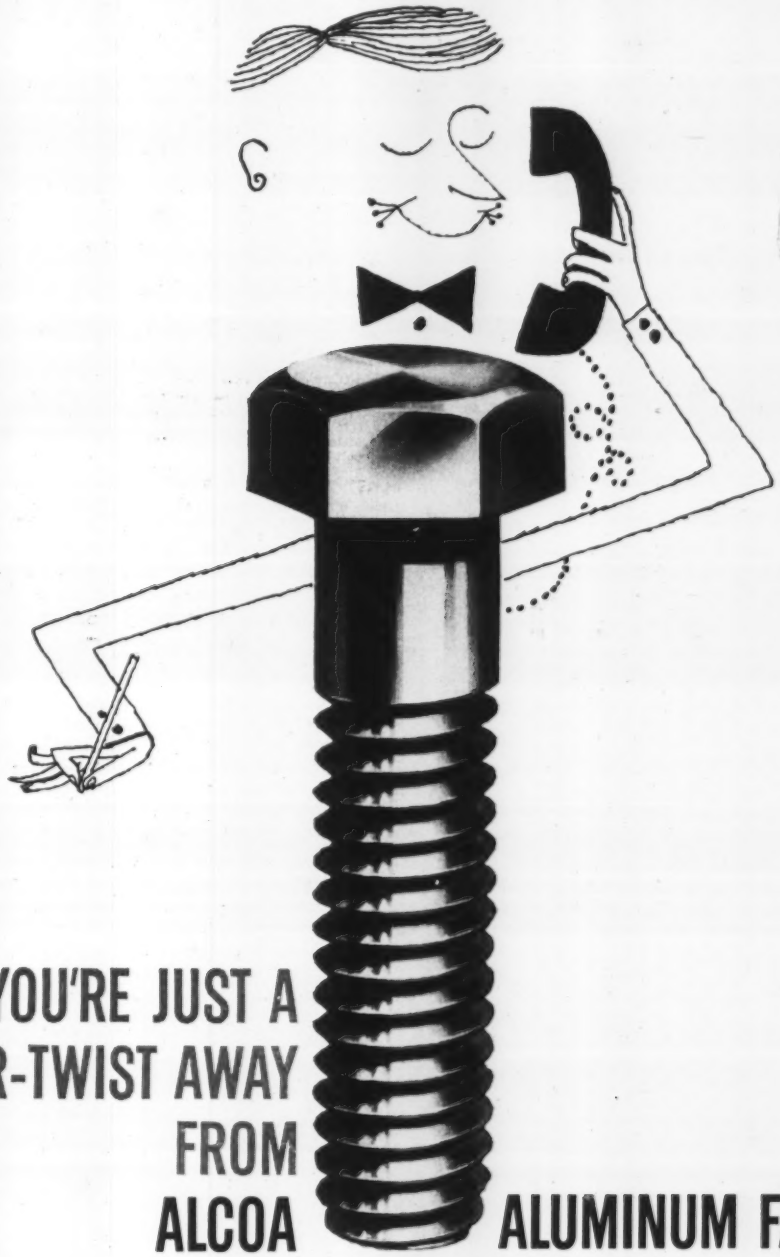
*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3, nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.



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Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill. R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	68.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	9.31	10.40	11.97	53.50	9.73	10.11	13.39#	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.30	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.15[2]	57.00	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	58.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.35	11.55	12.55	57.38	10.80	11.05	14.70	16.80	10.25	10.15	13.05
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **½ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [5]—1000 to 4999 lb; [10]—2000 lb and over.

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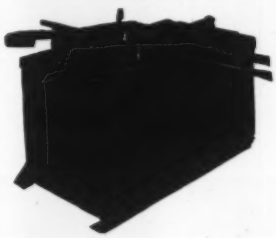
Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes, Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch, and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

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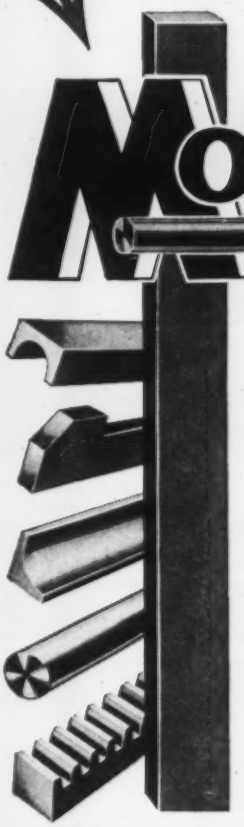
COLD DRAWN *Steel*



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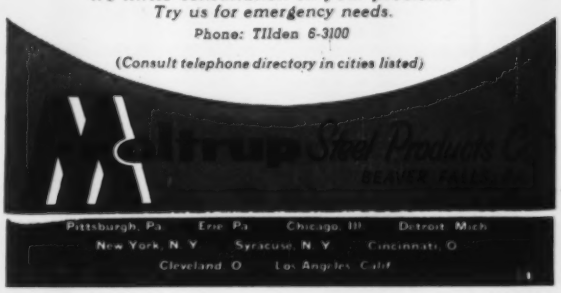

Pittsburgh, Pa. Erie, Pa. Chicago, Ill. Detroit, Mich.
New York, N. Y. Syracuse, N. Y. Cincinnati, O.
Cleveland, O. Los Angeles, Calif.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Curtner, Calif., $185; Canon City, Colo., $183.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Nario, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$10.75-11.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $0.915-$0.965 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe; Minimum trucklots, freight allowed east of Mississippi River:	
100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed	
Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.40-50.90†
Bronze, 5000-lb lots	52.20-56.20†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese, Electrolytic:	
Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.80-57.20†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10-53.60†
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom.**
1000 lb	2.80
less 1000 lb	2.95
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.40	$5.40	$5.30	$5.75
Bar Size Angles	5.10	5.10	5.00	5.43
Structural Angles	5.10	5.10	4.90	5.43
I-Beams	5.11	5.11	5.01	5.45
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.37	6.37	6.37	6.69
Sheets, H.R.	8.25	8.25	8.25	8.55
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.55	6.55	6.55	6.90
Merchant Bars	5.35	5.35	5.30	5.85
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.19	5.32	5.14	5.49
Wire Rods, O.H. Cold Heading Quality No. 5	5.09	6.22	6.04	6.34
Bright Common Wire Nails (§)	7.85	7.75	7.67	8.20

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal. f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	*24.00*
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, del.

Phenol, 90 per cent grade	15.50

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

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VISIT PHOENIX, ARIZONA
. . . winter headquarters of Mr. Sun. Warm, sunny days—cool, crisp nights. In a garden setting 10 miles east of Phoenix stands Jokake Inn—one of the Southwest's finest resort hotels. Swimming Pool, Tennis Courts, Putting Greens. All resort activities. Our own golf and riding facilities. Distinguished clientele. Informal atmosphere, casual dress.
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another of the great
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MAINTENANCE COSTS		TIME OUT
January	VERY HIGH	22 hours
February	STILL HIGH	17 hours

Switch to the

HKP® PORTER ONE-HOSE *Hydraulic* ROD and BAR CUTTER

IT'S PRACTICALLY . . .

MAINTENANCE FREE!

To slash those sky-high costs on bar and rod cutting operations and maintenance in your mill you need the superbly efficient, rugged, trouble-free one-hose PORTER HYDRAULIC ROD and BAR CUTTER. An all-job team of 3 Cutterheads and 5 Power Unit sizes offers just the right combination to handle any of your cutting work — faster better and at far lower cost. Here's why:

CONTINUOUS TROUBLE-FREE OPERATION

CUTTERHEAD PROTECTION — that eliminates constant "TIME OUT" and HIGH MAINTENANCE COSTS!

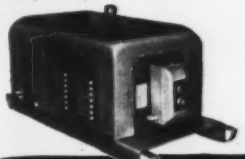
- **LONGER BLADES** with more bearing surface and rigid alignment eliminate side thrust and blade breakage.
- **FILTERED AIR** taken into the cylinder is forced out around the movable blade on each cut — eliminates the danger of dirt reaching bearing surface causing oil leakage and wear.
- **CONCENTRIC DESIGN** eliminates excessive wear of cylinder wall and ram.
- **LARGER CYLINDER AREA** allows the tool to cut capacity stock at a lower operating pressure, resulting in longer life for seal and hose.
- **SAFE, 12 VOLT CONTROL SWITCH** at the cutterhead gives instant finger-tip performance.
- **"KEY-POINT"** wear and replacement reduced to the minimum because of these exclusive HKP features.

A TRUE HYDRAULIC SYSTEM with these efficient, maintenance-saving features:

- **CONTROL VALVE** big and accurate enough for all industrial work. Solenoid operated.
- **EASY TO CHANGE RESERVOIR TYPE 10-MICRON OIL FILTER.**
- **PLUS** many other exclusive HKP features.

Ask to have a Porter Engineer tell you how the 3 CUTTERHEAD sizes and 5 HYDRAULIC POWER UNITS can provide the exact combination for your requirements.

OR — WRITE FOR COMPLETE PORTER HYDRAULIC ROD and BAR CUTTER FOLDER.



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H. K. PORTER, INC. Somerville 43, Mass.

Scrap Price Decline Is Unchecked

STEEL's composite on No. 1 heavy melting steel drops to $37.00, off $2.33 from the preceding week. Bottom of slump is not in sight. Mills aren't buying

Scrap Prices, Page 210

Pittsburgh—Prices are falling in an inactive market. Brokers bid $42.60 to $42.90 f.o.b. shipping point for Fisher Body Div.'s factory bundles (vs. $49.50 a month ago). Major consumers are relying heavily on their blast furnaces, supplementing hot metal with home scrap and material returned by customers. Dealers say they'd rather pile scrap in their yards than try to process it for the prices consumers are willing to pay. Railroad lists are expected to drop sharply because of the tremendous tonnages being offered.

Chicago—The market is off another $1 to $2 a ton from last published quotations. Brokers report only nominal sales to mills. One reported sale of No. 1 heavy melting industrial scrap was made at $40. A broker said he'd sell material for $37 if he could find a buyer. Normally, the spring weather should step up scrapyard activity. But inventories are bulging, and mills show no inclination to place large orders. The short term outlook: More price whittling.

Philadelphia — Scrap processors here say business doesn't look too good. Steel producers, they feel, have reached their planned limits on stockpiles. Demand is starting down as a result, and the drop is expected to continue through the third quarter.

Prices declined last week, No. 1 heavy melting falling to $36, No. 2 heavy melting to $30, No. 1 bundles to $39, No. 2 bundles to $24, No. 1 busheling to $38, electric furnace bundles to $41, mixed borings and turnings to $22, short shoveling turnings to $25-$26, machine shop turnings to $20-$21, heavy turnings to $34-$35, structurals and plates to $43-$44, couplers, springs, and wheels to $43, rail crops to $59-$60.

New York — Despite high steel mill operations and good demand from abroad, steel scrap prices are easier. Mills appear to be drawing more on inventory than heretofore, possibly with the thought of working stocks down in case of a steel strike this summer. Another factor may be a seasonable improvement in the movement of yard scrap with milder weather at hand.

Brokers' buying prices are down $1 a ton on No. 1 heavy melting and No. 1 bundles to $28-$29, and on No. 2 heavy melting to $25-$26. No change in No. 2 bundles is noted. Machine shop turnings are easier at $11-$12, mixed borings and turnings are $14-$15, and short shoveling turnings $15-$16, off $1 a ton in each case. Low phos structurals and plates are steady.

Prices on stainless steel specialty scrap are also unchanged.

Cleveland—The market here and in the Valley is off about $3 a ton.

WAREHOUSE OPERATIONS
can be vastly improved with EUCLID CRANES

Crosswise mounted, low headroom, motor driven trolley hoist. Capacities to 10 tons.

Warehouse operational efficiency is contingent in no small way upon material handling efficiency.

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Floor controlled and combination floor and cab controlled cranes are available in a range of types and capacities. The steel bar warehouse pictured here relies on their "Euclid" to handle a big share of the work.

Semi-gantry cranes handle mill shipments and the various materials for the processing lines.

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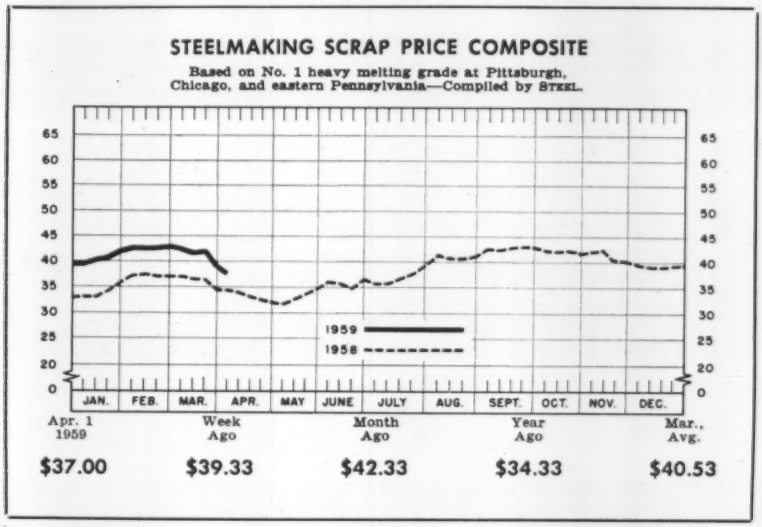


with No. 1 heavy melting quoted $36-$37 at Cleveland, and $40-$41 in the Valley. Weakness is general; in the absence of active mill demand, material is piling up in dealers' yards. Auto bundles are quoted $40-$41 here, off about $7 from the month-ago price.

Youngstown — On the basis of sales in other leading consuming areas, scrap prices here have drifted lower. The last sale of No. 2 bundles here was at $27. No. 1 heavy melting is nominally quoted around $41. One local steelworks is charging 55 to 60 per cent hot metal in its open hearths.

Buffalo — The market appears headed for a decline of at least $2 a ton on the leading steel grades and $1 on turnings. Except for cast scrap, the market is leaning decidely toward the offside. Dealers have been cutting their buying prices on the leading steel grades. But demand for cast remains strong, and prices are unchanged. There's said to be a shortage of cast because of heavy U. S. and Canadian demand.

Detroit — Prices are off further, following auto list closings last week. There's still no mill action, though Ford is reported to be paying $32, delivered, for foundry steel. Prices have dropped an average of $6 a ton in the last month. Most dealers and brokers feel they're close to the market bottom—that prices may shift $2 a ton either way by the end of April.

Cincinnati—Prices on the principal grades of steelmaking scrap are off another $1 to $2 a ton. Mill buying this month is expected to be below normal. Brokers are now offering $35.50-$36.50 for No. 1 heavy melting steel.

St. Louis—Prices on the open hearth grades continue to soften. The mills are not buying to any extent, high steelmaking operations being supported by hot metal and inventories. No. 1 heavy melting is off $1 a ton to $35, with No. 2 heavy melting quoted $33, and No. 2 bundles $26.

Birmingham — Although dealers anticipate some new mill buying this month, they'll not be surprised if the market drops lower. One or two mills have indicated they will return to the market, but the largest consumer of open hearth material apparently intends to depend on its stockpile. The movement of cast scrap is fair. The export market is quiet.

Houston—Brokers' buying prices for heavy melting grades are off $2 a ton on a new 45 day purchase for a district mill. The order carried a $2 springboard for scrap from areas requiring more than $3.80 freight. No. 2 bundles were not included in the purchase. The turnings price held unchanged.

Another 45 day delivery order from a second Texas mill has been covered. The order expires Apr. 30.

Western Gulf export buying is slow. Mexican buying plans are undetermined, but there's talk that south-of-the-border offers will be at sharply reduced levels.

Los Angeles — The market is steady, bolstered by Japanese commitments that are expected to total around 1 million tons, much of which will be collected on the Pacific Coast during the next six months.

Seattle—Export activity is adding strength to the local scrap market. For the second time in recent weeks, prices on the chief steelmaking grades have advanced. No. 1 heavy melting is quoted at $35 and No. 2 heavy melting at $33.

Japan is reported to have purchased five cargoes for shipment from Pacific Coast ports within three months. The strength has not spread to bundles, which are in plentiful supply.

Domestic buying has not increased, and the mills are still carrying large inventories.

San Francisco—While the mills hold plentiful supplies of scrap, they are being gradually reduced. The buoyant factor in the market is provided by exports. Some purchases on foreign account are being made above the domestic price level.

Pig Iron . . .

Pig Iron Prices, Page 204

Merchant pig iron bookings in March were the heaviest for any month so far this year. Demand is far from brisk, however. Some observers predict that a mounting shortage of cast scrap may force foundries to come into the iron market on a much larger scale in the second quarter.

Foundries have been using a high percentage of cast scrap in their melts because it is cheaper than iron. Supplies of cast scrap are beginning to dry up in many districts, indicating that foundries will be forced to increase the ratio of pig in their melts.

This could result in much better demand for foundry iron in the second quarter, coupled with a desire of foundries to turn out as much tonnage as possible prior to the threatened July 1 steel strike.

The situation of domestic sellers is complicated by offerings of foreign iron at prices well below the domestic market. About 3000 tons of Spanish iron and 6000 tons of Indian iron arrived recently on the East Coast. A fairly substantial tonnage of West German iron is reportedly en route to this country.

(Please turn to Page 215)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, April 1, 1959, *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Apr. 1	$37.00
Mar. 25	39.33
Mar. Avg.	40.40
Apr. 1958	33.08
Apr. 1954	25.67

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	33.00-34.00
No. 1 dealer bundles	*39.00-40.00*
No. 2 bundles	26.00-27.00
No. 1 busheling	38.00-39.00
No. 1 factory bundles	*46.00-47.00*
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals:	
2 ft and under	*48.00-49.00*
3 ft lengths	*47.00-48.00*
Heavy turnings	34.00-35.00
Punchings & plate scrap	*49.00-50.00*
Electric furnace bundles	*49.00-50.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No .1 R.R. heavy melt	39.00-40.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Random rails	55.00-56.00
Railroad specialties	51.00-52.00
Angles, splice bars	51.00-52.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	120.00-125.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*39.00-40.00*
No. 1 hvy melt., dealer	*37.00-39.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 factory bundles	*42.00-43.00*
No. 1 dealer bundles	*39.00-40.00*
No. 2 bundles	27.00-28.00
No. 1 busheling, indus.	*39.00-40.00*
No. 1 busheling, dealer	*37.00-39.00*
Machine shop turnings	20.00-21.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Cut structurals, 3 ft	*44.00-45.00*
Punchings & plate scrap	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Stove plate	*43.00-44.00*
Unstripped motor blocks	*37.00-38.00*
Clean auto cast	*54.00-55.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*43.00-44.00*
R.R. malleable	*56.00-57.00*
Rails, 2 ft and under	*55.00-56.00*
Rails, 18 in. and under	*56.00-57.00*
Angles, splice bars	*51.00-52.00*
Axles	*69.00-70.00*
Rails, rerolling	*60.00-61.00*

Stainless Steel Scrap

18-8 bundles & solids	215.00-225.00
18-8 turnings	120.00-125.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*40.00-41.00*
No. 2 heavy melting	*38.00-39.00*
No. 1 busheling	*40.00-41.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	*25.00-26.00*
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	45.00-46.00
Electric furnace bundles	*41.00-42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*

CLEVELAND

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 factory bundles	*40.00-41.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	*37.00-38.00*
Cut structurals, plates 2 ft and under	*44.00-45.00*
Low phos, punchings & plate	*37.00-38.00*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	47.00-48.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	*57.00-58.00*
Rails, 18 in. and under	*58.00-59.00*
Rails, random lengths	*52.00-53.00*
Cast steel	*46.00-47.00*
Railroad specialties	*48.00-49.00*
Uncut tires	*42.00-43.00*
Angles, splice bars	53.00-54.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*35.00*
No. 2 heavy melting	*33.00*
No. 1 bundles	38.00
No. 2 bundles	*26.00*
No. 1 busheling	38.00
Machine shop turnings	20.00
Short shovel turnings	22.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	41.00
Clean auto cast	50.00
Stove plate	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.50
Rails, 18 in. and under	53.00
Rails, random lengths	47.50
Rails, rerolling	59.00
Angles, splice bars	49.00

BIRMINGHAM

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	21.00-22.00
No. 1 busheling	33.00-34.00
Cast iron borings	14.00-15.00
Machine shop turnings	*23.00-24.00*
Short shovel turnings	*24.00-25.00*
Bars, crops and plates	41.00-42.00
Structurals & plates	40.00-41.00
Electric furnace bundles	39.00-40.00
Electric furnace:	
2 ft and under	38.00-39.00
3 ft and under	37.00-38.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	40.00-41.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	*49.00-50.00*
Rails, rerolling	55.00-56.00
Rails, random lengths	43.00-44.00
Angles, splice bars	44.00-45.00

PHILADELPHIA

No. 1 heavy melting	*36.00*
No. 2 heavy melting	*30.00*
No. 1 bundles	*39.00*
No. 2 bundles	*24.00*
No. 1 busheling	*38.00*
Electric furnace bundles	*41.00*
Mixed borings, turnings	*22.00*
Short shovel turings	25.00-26.00
Machine shop turnings	*20.00-21.00*
Heavy turnings	*34.00-35.00*
Structurals & plate	*43.00-44.00*
Couplers, springs, wheels	*43.00*
Rail crops, 2 ft & under	59.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	43.00
Drop broken machinery	49.00-50.00
Malleable	68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	18.00-19.00
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*15.00-16.00*
Low phos. (structurals & plates)	35.00-36.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	32.00-33.00
No. 1 bundles	39.00-40.00
No. 2 bundles	27.00-28.00
No. 1 busheling	39.00-40.00
Mixed borings, turnings	20.00-21.00
Machine shop turnings	18.00-19.00
Short shovel turnings	22.00-23.00
Cast iron borings	20.00-21.00
Low phos sturcturals and plate, 2 ft and under	47.00-48.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	51.00-52.00

Railroad Scrap

Rails, random lengths	49.00-50.00
Rails, 3 ft and under	55.00-56.00
Railroad specialties	48.00-49.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*35.50-36.50*
No. 2 heavy melting	*30.50-31.50*
No. 1 bundles	*35.50-36.50*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*35.50-36.50*
Machine shop turnings	*18.00-19.00*
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*18.00-19.00*
Low phos., 18 in.	47.00-48.00

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Heavy breakable cast	*39.00-40.00*
Charging box cast	38.00-39.00
Drop broken machinery	*48.00-49.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*
Rails, 18 in. and under	*56.00-57.00*
Rails, random lengths	*48.00-49.00*

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	*36.00*
No. 2 heavy melting	*33.00*
No. 1 bundles	*36.00*
No. 2 bundles	23.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	43.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	30.00
No. 2 heavy melting	23.00-23.50
No. 1 bundles	30.00
No. 1 busheling	30.00
Machine shop turnings	11.00-11.50
Short shovel turnings	13.00-14.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	18.00-19.00
No. 1 bundles	*29.00-30.00*
No. 2 bundles	*15.00-16.00*
No. 1 busheling	*27.00-28.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*15.00-16.00*

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Stove plate	30.00-31.00
Charging box cast	*32.00-33.00*
Heavy breakable	32.00-33.00
Unstripped motor blocks	*19.00-20.00*
Clean auto cast	*43.00-44.00*

SEATTLE

No. 1 heavy melting	*35.00*
No. 2 heavy melting	*33.00*
No. 1 bundles	29.00†
No. 2 bundles	23.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1.	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	21.00
Machine shop turnings	*17.00*
Shoveling turnings	18.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

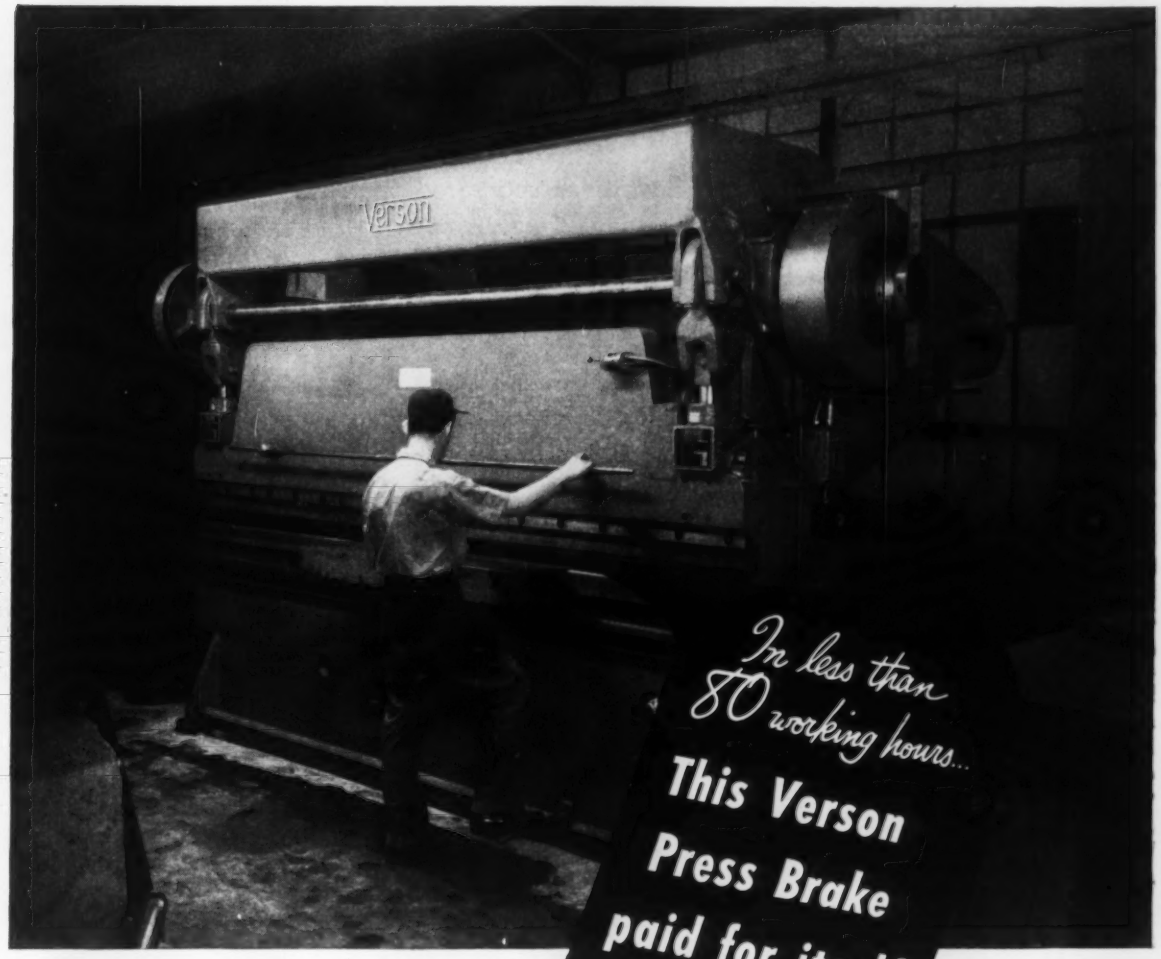
(Brokers' buying prices)

No. 1 heavy melting	34.50
No. 2 heavy melting	30.50
No. 1 bundles	34.50
No. 2 bundles	25.00
Mixed steel scrap	26.50
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	34.50
Unprepared	28.50
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	45.00

†Nominal.
‡F.o.b. Hamilton, Ont.



Add Chicago Dryer Company, Chicago, Illinois, to the ever-growing list of satisfied Verson Press Brake owners. In the manufacture of "America's most complete line of commercial flatwork ironers", Chicago Dryer Company uses this Verson No. 2010 Intermediate Series Press Brake to form flatwork ironer end frames from 5′ lengths of 11 ga. mild steel. Two bends are made, utilizing the Verson Press Brake handled by two operators. In the past, this job required six men working with a hand brake.

Two trays are furnished with each of fifteen flatwork ironer models manufactured. Formed from 12′ lengths of 16 ga. mild steel, the trays were formerly fabricated by an outside source. Carrying an inventory ranging from 5 to 25 trays for each of fifteen ironer models was necessary. Using the Verson Press Brake, trays are now formed as needed, eliminating inventory and reducing the cost per piece.

Although this Verson Brake has been operated only 80 working hours since installation, Chicago Dryer Company reports the machine has already paid for itself in labor savings, convenience and increased production.

A Verson Press Brake may be the answer to your metal forming problems. It costs nothing to investigate. Call or write, today.

A Verson Press for every job from 60 tons up.

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Verson

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Ask Lead-Zinc Help

Several bills to aid domestic industry have been sponsored in Congress and more will probably come. Chances for passage are slim. Lead price down to 11 cents

Nonferrous Metal Prices, Pages 214 & 215

WINTER is officially over. That perennial harbinger of spring, the plea for aid to the domestic lead and zinc industry, is back. But the tune is familiar. Only the titles are different.

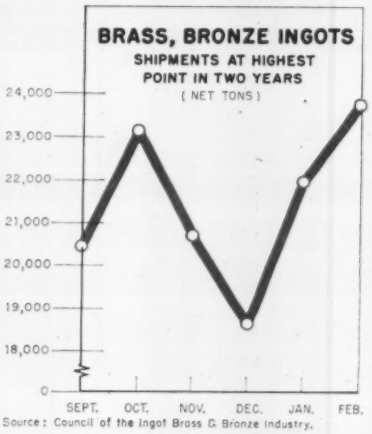
• **In the Hopper**—Two bills have been presented to the Senate. The first, sponsored by Sen. James E. Murray (D., Mont.), is aimed at supporting the domestic prices at 15.5 cents a pound for lead and 13.5 cents for zinc. It would give the secretary of commerce authority to hold down imports so the prices could be maintained. If adopted, the measure would mean another cut in the amount of foreign origin lead and zinc that can be brought into the U. S.

The second bill would grant a subsidy to producers on limited amounts of the two metals. Sponsored by Sen. Gordon Allott (R., Colo.), it would authorize payment to producers of the difference between the market price and a price of 16 cents a pound for lead and 13.5 cents for zinc for a one year period. But payment would be confined to 500 tons of lead and zinc per quarter for any one producer.

Senator Allott says his bill is designed to give "immediate and temporary relief to our small lead and zinc miners who are still in trouble. Production payments will primarily assist the 90 per cent of our lead-zinc producers who in 1956 produced about 16 per cent of our output."

• **More Coming** — Look for more bills calling for increased government aid to lead and zinc to appear in the next few weeks, say Capitol Hill prognosticators. One indication: Reliable reports have it that the Senate Interior Committee will hold hearings on both metals around the middle of May. Some leading Democrats are convinced import quotas are not working.

• **Overstated** — Many nonferrous people believe the senators are perhaps making the situation out to be a little more serious than it is. No one will deny the quota program has been only partially successful, that barter is of virtually no benefit, and that the market for both metals is none too strong. But most observers believe quotas will become fairly effective later in the year as the metal already brought in disappears from the market.



Source: Council of the Ingot Brass & Bronze Industry.

Senator Allott backs this viewpoint: "Unless hearings indicate there is no possibility for the lead-zinc picture to improve, we should give the present quota program a full trial with only this limited and temporary program being offered to help our small miners."

• **Chances** — Don't look for Congress to be much impressed by any pleas mine state senators may make. Legislators have been unwilling to pass any of the numerous bills calling for subsidies or higher tariffs, and there's no reason to believe they'll have a change of heart in this session. It will be especially tough to push through any legislation with business on the rise. Lead sales are expected to go up 5 to 10 per cent this year; zinc sales may show a 10 to 20 per cent improvement. (See STEEL, Mar. 30, p. 39.)

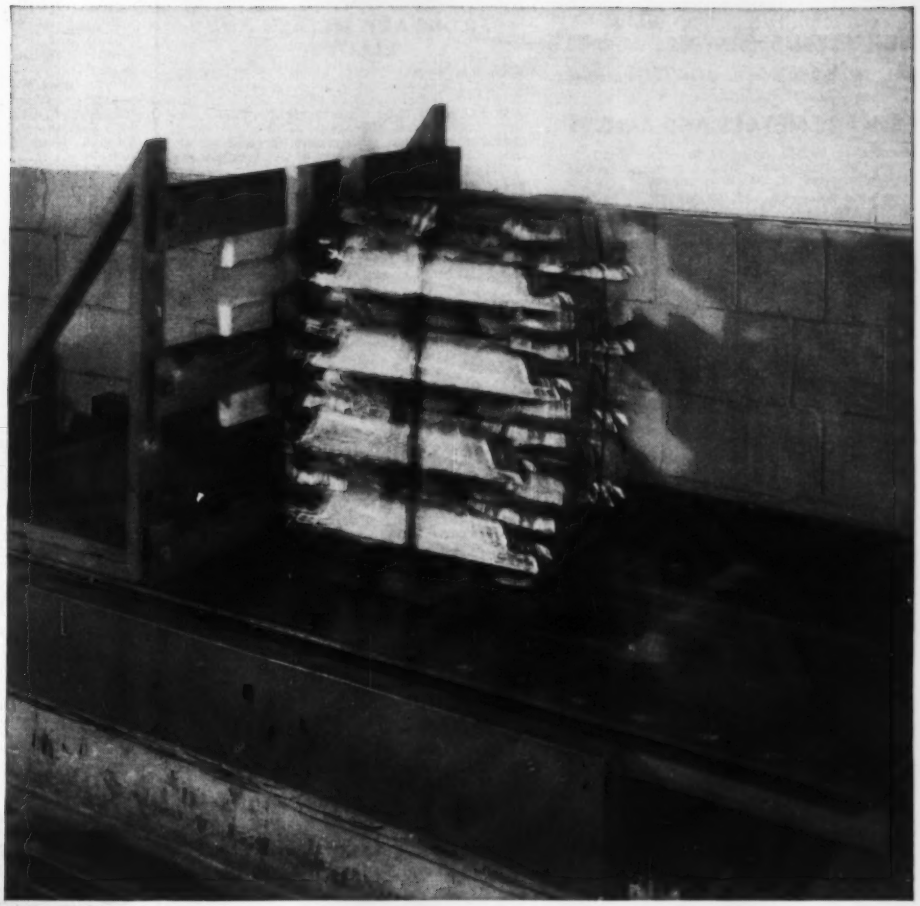
• **Still Flimsy**—The business being done in both metals leaves a lot to be desired. Take lead: Though demand has picked up a bit, it's still frail. A price drop in Canada and weakness on the London Metal Exchange triggered a 0.5 cent drop in the domestic price to 11 cents a pound on Apr. 1. The price outlook depends on how well customers respond to the new quotation.

Zinc sales are a little better, although still slow. Galvanizers have been more active in ordering lately; diecasters are still shy about buying. The price looks stable.

NONFERROUS PRICE RECORD

	Price Apr. 1	Last Change	Previous Price	Mar. Avg	Feb. Avg	Apr., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.50–34.00	Mar. 16, 1959	31.50–32.00	32.031	30.159	24.323
Lead	10.80	Apr. 1, 1959	11.30	11.238	11.368	11.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.625	Apr. 1, 1959	102.50	103.000	102.364	93.021
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.409	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



Vibration test of ingot bundle. Signode vibrator handles up to 3 tons at accelerations over one G.

After test, equivalent to the effect of expected actual handling and transit, the bundle still looked like this.

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A neat 2,300 pound bundle of aluminum ingots becomes 44 ingots trying desperately to go their separate ways...driven by the joggles and jolts of the vibration tester in the Signode Packaging Laboratory. The ingots hold together, though. They're bound to...by 51 cents worth of steel strapping pulled to about 3,000 pounds tension. We don't know of another material that could do this job at all...let alone at such low cost. And consider the savings of having Signode find out *in advance* and at no cost to you how to make your product behave in transit. This is one more way Signode helps make things cost less to handle, store, ship, and receive. For further information, talk to the Signode man near you, or write:

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg; $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 34.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 10.80; chemical, 10.90; corroding, 10.90, St. Louis. New York basis, add 0.20.

Lithium: Cups or ingots, 50-100 lb, $10 per lb, f.o.b. Minneapolis; 100-500 lb, $9.50 per lb deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $227-231 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.625.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00. 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 13.50; No. 2, 14.00; No. 5, 13.75 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 19.75.

Brass Ingot: Red brass, No. 115, 32.25; tin bronze, No. 225, 43.25; No. 245, 37.00; high-leaded tin bronze, No. 305, 36.50; No. 1 yellow No. 405, 26.50; manganese bronze, No. 421, 29.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $16.50 per cwt; pipe, full coils, $16.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.50-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	....
0.136-0.096	43.20-48.30	....
0.126-0.103	....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	....
0.077-0.061	....	39.50-40.70
0.068-0.061	44.30-52.20	....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circle: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam, 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	42.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 26.50-27.00; No. 2 heavy copper and wire, 24.50-25.00; light copper, 22.50-23.00; No. 1 composition red brass, 21.00-21.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 20.00-20.50; new brass clippings, 17.50-18.00; light brass, 14.00-14.25; heavy yellow brass, 15.00-15.25; new brass rod ends, 15.25-15.75; auto radiators, unsweated, 16.25-16.75; cocks and faucets, 16.75-17.25; brass pipe, 16.75-17.25.

Lead: Soft scrap lead, 7.25-7.75; battery plates, 3.25-3.50; linotype and stereotype, 8.75-9.25; electrotype, 7.25-7.75; mixed babbitt, 8.75-9.25.

Monel: Clippings, 26.00-28.00; old sheets, 23.00-25.00; turnings, 20.00-21.00; rods, 26.00-28.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 38.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 3.00-3.25; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.25-13.75; segregated high copper clips, 13.25-13.75; mixed low copper clips, 12.25-12.75; mixed high copper clips, 11.25-11.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.75-12.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.75-17.25; segregated high copper clips, 15.75-16.25; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.25-15.75.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.50-15.00; segregated high copper clips, 13.00-13.50; mixed low copper clips, 13.50-14.00; mixed high copper clips, 12.50-13.00.

REFINERS' BUYING PRICES
(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 29.50; No. 2 heavy copper and wire, 28.00; light copper, 25.75; refinery brass (60% copper) per dry copper content, 28.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 29.50; No. 2 heavy copper and wire, 28.00; light copper, 25.75; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 17.00; yellow brass turnings, 16.00; radiators, 18.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 42.50, 2000-5000 lb lots; cast, 45.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 120.50; 200-499 lb, 119.00; 500-999 lb, 118.50; 1000 lb or more, 118.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more 17.80.

Sodium Stannate: Less than 100 lb, 79.50; 100-600 lb, 70.20; 700-1900 lb, 67.40; 2000-9900 lb, 65.60; 10,000 lb or more, 64.20.

Stannous Chloride (Anhydrous): 25 lb, 155.00; 100 lb, 150.10; 400 lb, 147.70; 800-19,900 lb, 106.80; 20,000 lb or more, 100.70.

Stannous Sulphate: Less than 50 lb, 140.20 50 lb, 110.20; 100-1900 lb, 108.20; 2000 lb or more, 106.20.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 209*)

Sharon Steel Corp. has blown in a second blast furnace at its Roemer Works, Farrell, Pa., after a relining job. The furnace had a break-out about a month ago, just after the other furnace there was blown in.

Distributors . . .

Prices, Page 204

Final accounting for March will show an increase over February of up to 20 per cent in bookings by steel service centers. Part of the gain is attributed to improved weather which has permitted more activity in the construction and agricultural industries.

Inventories are in good shape and no product is in particularly strong demand. Distributors think a marked upturn in consumption would help them more than the current build-up of users' inventories. Reason: Stockpiling is planned far in advance and most of the orders go to mills. If there were a sudden pick-up in any major consuming industry, users would have to augment mill purchases at steel service centers.

"We cash in on sudden changes in immediate needs," a distributor comments. "We get the spillover business that mills can't handle." Distributors anticipate a flurry of orders in June when buyers are expected to make last minute preparations for a possible steel strike.

Some price weakness has developed in the Southwest, due to scattered forced selling by importers.

Wire . . .

Wire Prices, Pages 200 & 201

Wiremakers' bookings are up noticeably, some mills reporting their March volume was the best in more than a year. April-May shipment tonnage is at least 15 per cent over the March total in New England, and sellers in other areas are doing about as well.

While consumers are engaging in some hedge buying of cold heading, spring, and manufacturers' wire, June order books still have openings for late tonnage placement. Most mills are handling additional tonnage without adding to production crews. The bulge in buying is not heavy enough to substantially extend shipment promises, except for some specifications requiring longer processing.

Screw and fastener demands are up, notably auto requirements.

Wickwire Spencer Div., Colorado Fuel & Iron Corp., Buffalo, has booked an $890,310 contract for nearly 25.5 million linear feet of steel wire strand from the U. S. Engineer, Memphis, Tenn.

CLASSIFIED ADVERTISING

WANTED

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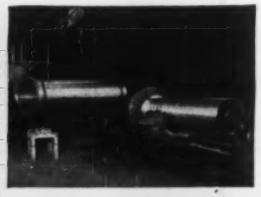

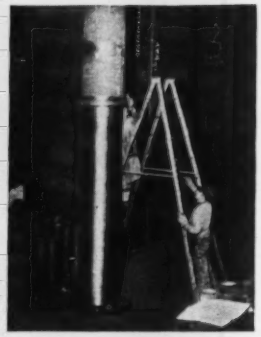

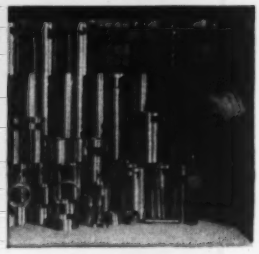

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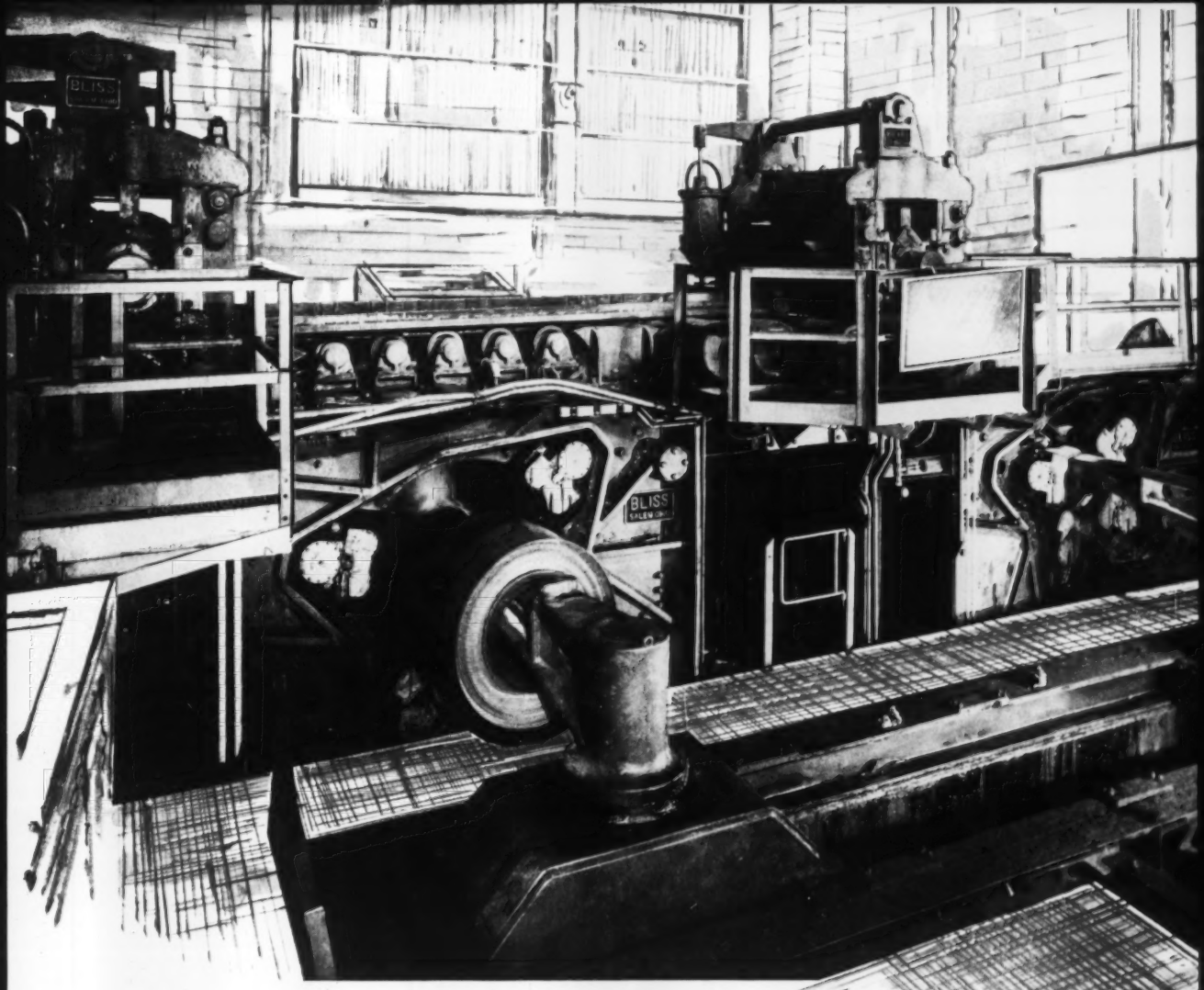

FROM MILD STEEL TO STAINLESS

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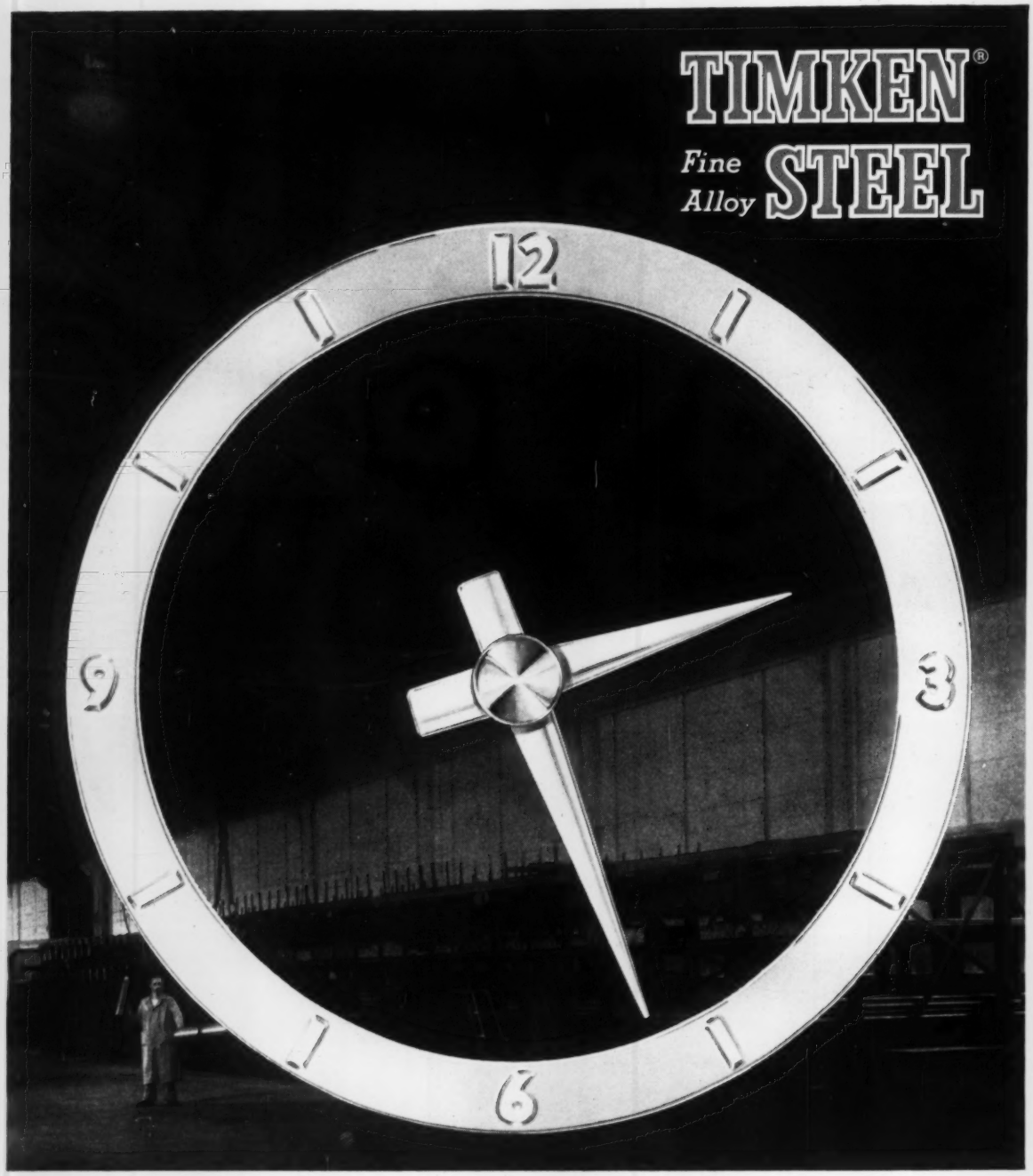

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